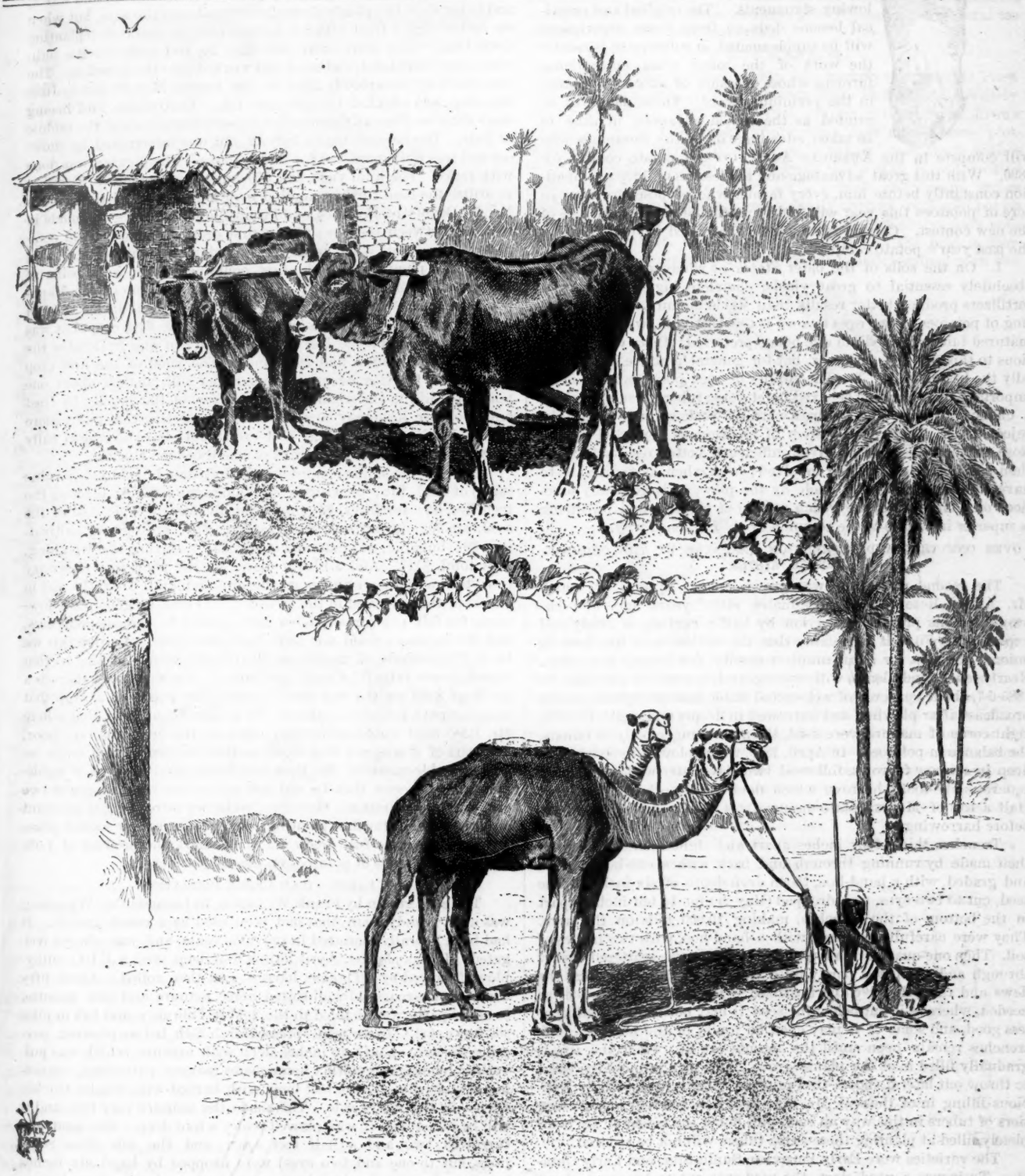
AMERICAN AGRICULTURIST

FOR THE

FARM · GARDEN · & · HOUSEHOLD

"AGRICULTURE IS THE MOST HEALTHFUL, MOST USEFUL, AND MOST NOBLE EMPLOYMENT OF MAN."—WASHINGTON.

VOLUME XLIX.—No. 2. NEW YORK, FEBRUARY, 1890. NEW SERIES—No. 517.



EGYPTIAN DUMB SERVANTS IN FIELD AND DESERT. (*See Page* 65.)

COPYRIGHT, 1890, BY THE ORANGE JUDD CO.

ENTERED AT THE POST-OFFICE AT NEW YORK, N. Y., AS SECOND CLASS MATTER.

LESSONS OF THE POTATO COMPETITION.

THE award of prizes in the potato class of the AMERICAN AGRICULTURIST Prize Crop Competition was published in our last issue, for January. The complete story of the grand prize crop was also given. The main points in the experience of several other contestants are condensed into the following statements. The original and practical lessons deduced from these experiences will be supplemented in subsequent issues by the work of the many other enterprising farmers whose measure of success appeared in the premium award. These data will be printed as the season advances, in time to be taken advantage of by the thousands who will compete in the AMERICAN AGRICULTURIST potato contest for 1890. With this great advantage and the lessons of 1889's competition constantly before him, every farmer who proposes to plant an acre of potatoes this year will find it profitable to enter the lists of the new contest. Certain facts are demonstrated beyond cavil by the past year's potato competition:

1. On the soils of the older States, or wherever manuring is absolutely essential to great yields, complete high-grade special fertilizers produce better results than stable manure. 2. The cutting of potatoes to two eyes to a set is the best plan, well-developed matured tubers of medium size being preferred; there were exceptions to this rule the past year, but for general practice it is decidedly the best method. 3. The vitality of seed potatoes is far more important than has been believed heretofore; tubers should be given a chance to start, and all backward or weak sprouts should be rejected. 4. The trench system of planting, as perfected by Mr. Rose and described below, gives sufficiently better results to more than pay for the extra labor involved; even when so modified as to have the trenches wholly made by the plow, as is generally practiced on a large scale, the trench system of planting and fertilizing is superior in results to the common or old-fashioned way.

OVER ONE THOUSAND BUSHELS ON ONE ACRE BY THE ORIGINAL TRENCH SYSTEM.

The second prize crop was grown upon a system of which Mr. Alfred Rose was the originator sixty years ago, and has brought to its present perfection by half a century of study and experience. First, it is notable that the contest acre has been in onions, potatoes, or corn, uninterruptedly, for twenty-five years. Nearly level, sandy loam, with some gravel, it received annually, in 1885-6-7, about ten cords of well-rotted stable manure, spread evenly broadcast after plowing, and harrowed in deeply and well. In 1888, eight cords of manure were used, the acre being mostly in onions, the balance in potatoes. In April, 1889, it was plowed twelve inches deep in narrow furrows, followed two days later with a common square, spike-tooth harrow, which does good work on such soil. Half a ton of Mapes potato-manure was evenly sowed broadcast before harrowing.

Trenches thirty-four inches apart and eight inches deep were then made by running through and back with a one-horse plow, and graded, with a hand-hoe, to an even depth of six inches. The seed, cut to two eyes, was dropped (May 2) nine to ten inches apart in the bottom of the trenches, making 19,000 hills on the acre. They were carefully covered, with a hand-hoe, with two inches of soil. Then one-quarter of a ton of the fertilizer was scattered evenly through and along the partly-filled trenches. The idea is that the dews and rains dissolve the fertilizer and carry it into the soil as needed, whereas, if put below the seed, it may not be dissolved, does less good, and some of it may even be found at the harvest. The trenches remain open until the sprouts are up, when the soil is gradually filled in as the plants grow. This plan induces the plant to throw out lateral shoots that produce extra tubers, and, by judicious filling in of the soil, Mr. Rose says it is possible to get three tiers of tubers in this way on each hill, but if the trenches are completely filled at planting these extra tubers will not be secured.

The varieties were Early Peruvian, Sunlit Star, and Early Ontario. To insure a good start, the seed was cut to two eyes about four weeks before planting, and dusted with plaster (ground gypsum). At planting, all sets were thrown out in which sprouts were not well started, and, remarkable as it may seem, not a hill failed to grow. Dormant eyes were not used, and seed ends containing many eyes were partly discarded. This gave not only a full but an even stand, for if one hill gets much of a start it will retard its neighbors and lessen the crop. Late plantings between large hills well started never amount to much, the growth being so dense. Evenness of the growth also requires grading the trenches to one depth. All but about two bushels of the potatoes planted had been grown on the same farm for from three to nine years. Home-grown seed has always done the best with Mr. Rose, and last year was no exception.

The weather at planting (May 3) was fine, the soil dry and warm, and in ten days the plants showed evenly all over the acre, but when six inches high a frost killed a portion and necessitated replanting 3,000 hills. They were cultivated May 15, and again on the 20th, when they were hoed, and some soil worked into the trenches. The trenches were completely filled at the hoeing May 25, but in June the crop was affected by excessive rain. Cultivating and hoeing were done as often as the weather permitted until about the middle of July. The harvest began July 22, but was interrupted by showers and was not completed for several days. The digging was done with forks. The total yield was 669 bushels 53½ pounds. Desiring to utilize the land further, another planting of late varieties—Rose's No. 74, Beauty of Beauties, and Peach-Blow Seedling—was made in trenches between the rows of the first crop, on June 29, and completed July 7, all work being prevented in the interval by rain. The second planting, like the first, contained 19,000 hills, being at the same distances as before. One quarter of a ton of the Mapes potato manure was strewn in the trenches, making in all one ton on the contest acre. It was cultivated like the first crop, but was cut down by blight the last of August. When dug in October the yield was 361 bushels and 26 pounds. The yield of the first crop averaged a fraction over two pounds per hill, against about one pound per hill in the second crop. In view of the damage by frost and flood, Mr. Rose may be pardoned for expecting that under more favorable circumstances the first crop would have averaged fully three pounds per hill, or upward of one thousand bushels.

The expense on the contest acre is thus stated: Interest on value ($200) of land, $12; plowing, $3.50; harrowing, $1.75; opening the trenches, $2; fertilizer, $44; applying the same, $1.50; cost of the seed, $16.50; cutting seed and planting, $10; hoeing and cultivating, $6; bugging, $1; harvesting, $31.25; assorting and weighing, $16; total, $147. Add a liberal charge for the plant-food necessary to restore what such an enormous crop removed from the soil in excess of that supplied in the fertilizer, and making generous allowances for fair pay for any labor not covered in the above figures, and the expenses could not have been over $200. Against this we have 910 bushels of merchantable tubers, worth in the section where grown fully fifty cents per bushel. On this basis, there is a profit of $255 on the one acre. Surely, the potato is a crop that amply repays intensive culture. It is significant, also, that where Mr. Rose used stable-manure on potatoes, the crop was very poor, and part of it was not dug at all, so that fertilizers paid twice as well as stable-manure. Mr. Rose has always been in favor of stable-manure. It seems that he did not notice our ruling against two crops or two plantings; therefore, while we were obliged to count only the yield of the first planting, which captured our second prize, Mr. Rose deserves full credit for the remarkable product of 1,031 bushels 19½ pounds of potatoes on the contest acre.

A LARGE YIELD UNDER IRRIGATION.

The acre grown by Frank W. Isham, in Laramie Co., Wyoming, was a dry, sandy loam, that had been used as a ranch garden. It had been liberally manured in previous years, and was always irrigated. It was plowed, April 15th, a foot deep, with a J. I. C. sulky-plow, followed by a Thomas harrow, and then rolled. About fifty cords of two-years-old well-rotted horse manure and cow manure, in equal parts, were hauled to the field in February, and left in piles six feet apart. These were spread March 25th, before plowing, covering the acre about two inches deep with manure, which was pulverized by dragging with a home-made manure pulverizer, consisting of five poles, twelve feet long, with barbed-wire staples thickly driven in the under side. This made the manure very fine, and it will be noted that it was plowed under a foot deep. The land was furrowed two and a half feet apart, and the sets (Rose Seedlings, cut to one and two eyes) were dropped by hand, six inches apart, and covered with about seven inches of soil, plowed upon them, the acre being well rolled immediately afterwards, to firm the soil about the seed.

The acre plot was harrowed on May 30th, before the crop showed, in order to kill the small weeds, the Thomas smoothing harrow being used. The crop was well up on the 15th, though

a week before a foot of snow had fallen, which soon disappeared. It was hoed for the second time on June 21st, to stir the ground well, and again some days later. The early season was quite wet. It rained all night July 7th, and there were showers on the 9th and 12th. The crop was hoed on July 3d, at which time the large and green tops were badly nipped by frost.

The crop was plowed out on July 13th, irrigated on the 17th and 18th, again on August 8th, and, for the last time, on August 30th,

FIG. 1. IRRIGATING THE CROP.

there being two showers meanwhile, on the 13th and 19th. There was a frost just after the last irrigating. On account of the altitude—6,500 feet—the potatoes will stand moisture that in the East would be excessive, because, in the very dry air, the water evaporates rapidly; so much so that water run in a ditch for one mile evaporates to the extent of one-fifth. The irrigating consisted in letting water run between the rows from the irrigating ditch, as shown in Fig. 1. The rule, as practiced in Greeley, Colorado, that, when irrigating, the water must not be left running so long that the crown of the plant should become soaked, was not practiced, but the soil was so wet that, stepping on the hill, one would sink ankle-deep. The first ten rows were dug with hand-forks (see Fig. 2), then every other row was plowed out and forked. Then the remaining thirty rows were forked out as the first. After the merchantable tubers were dug up, the small ones were gathered. The acre was plowed, and any remaining tubers picked out of the furrow, when the land was harrowed, and more potatoes picked out. Even after all this

FIG. 2. DIGGING.—"READY, GO."

care, a heavy rain, following the harvest, revealed still more tubers. The whole cost of harvesting and weighing was excessive ($52.50), owing to expensive help.

The potatoes that were dug from the rows in which was planted seed that was dried for three days after cutting, and placed with the cut side down, were much larger (see Fig. 3) than where freshly-cut seed was dropped, fully one-third of them weighing from one and three-quarters to two pounds each. The tops of these potatoes were much thicker and higher. Samples of the crop when boiled or baked were very mealy and cracked open in the most desirable fashion, proving that tubers raised by irrigation are as good as those raised here without it. After raising potatoes in Connecticut, New York, and Northern Kansas, Mr. Isham has never found tubers of finer quality, or so uniformly large (see Fig. 4), and the large ones being perfectly solid. He says that the larger the tops the more starch the potato has, and therefore the better and more nutritious the quality. Out of twenty-six varieties he planted this year, the Rose Seedling surpassed all. There were 416 bushels of merchantable tubers, averaging 96 potatoes to the bushel, and a little over 13 bushels of small tubers, 1,321 to the bushel, the total crop weighing 26,056 pounds.

The expenses include, for interest, $1.80; plowing, $2.75; harrowing and rolling, $1.95; applying stable manure, $23.50, no charge being made for the manure; cutting the seed and planting, $17.70; hoeing, plowing, etc., $8.95; irrigating, $5.50, it requiring two days for each of the three irrigatings except the first, the charge being $1 a day; harvesting, weighing, etc., $52.52; total expenses, $136.15. At 30 cents per bushel, the crop was worth $125 but under ordinary circumstances the harvesting would cost only $10 or $15. The crop is entirely free from scab, though Mr. Isham points out that potatoes are almost always scabby if stable manure is applied in the hill; thus confirming in Wyoming the general testimony of Eastern potato-growers.

A FOUR-ACRE TEST.

A contestant who came within two bushels of a prize is President John M. Smith, of the Wisconsin State Horticultural Society whose experience with four plots of one acre each in Brown county is most interesting. They were laid out in long plots separated by a furrow or alley, on a nearly level tract with a slight southern exposure, and of great uniformity in soil, treated alike in all respects since 1884. It is a dark, sandy loam, rather damp than dry, with no stones, originally covered with wild poplar interspersed with burr oaks and white pine, which on such soils usually indicate an abundance of phosphates. The field is thoroughly surface-drained, and about half of it underdrained with two

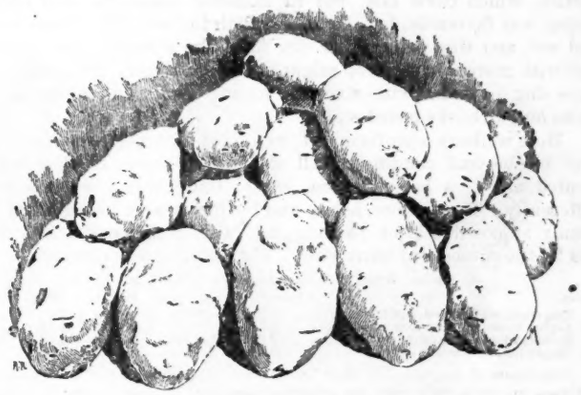


FIG. 3. A SELECTION FROM WYOMING.

and one-half inch tile. Two acres received about one hundred bushels per acre of unleached wood-ashes in 1885, and were planted to potatoes, the other half was in cabbage, with thirty two-horse loads per acre of compost. The whole field received thirty-five loads per acre of manure in 1886, and that spring a portion was set to strawberry plants, quick-growing crops like lettuce and radishes being grown between the rows. About one hundred bushels of unleached wood ashes were sowed the following spring, and, after picking the berries, the field was plowed, again manured, and set to late cabbage. The other portion was in cabbage in 1886-7, and the whole field grew a large crop of cabbage in 1888, receiving thirty loads per acre of manure annually.

The field was plowed April 23d to a depth of eight to nine inches, the season being early. A span of horses, weighing 1,250

FIG. 4. A UNIFORM LOT IN THE BIN.

pounds each, and one man, plowed the four acres in three days with a Mohawk Valley Clipper plow. Three days later the Cutaway harrow was used, followed by the Roller harrow, both excellent implements. Both harrows lapped about half their width, which was equivalent to harrowing it twice. "The land was in as good

condition as I can fit land," which means that it could not be better, as Mr. Smith is a famous cultivator. Early Ohio potatoes, cut toward the stem end to one eye, if a large one, and to two or even more if the eyes seemed poor or weak, were, on May 1st and 2d, dropped twelve inches apart in drills thirty inches distant, and covered three inches deep, 651 pounds of seed being used for the 17,424 hills in each acre. The land being marked out in rows, a man strikes his hoe into the mellow soil at the beginning of a row and throws out the soil, repeats the operation twelve inches ahead, and with this earth covers the set which a boy has just dropped in the first hole. It takes a pretty lively boy to drop fast enough, as the covering is done at the one operation. The seed came up irregularly, but nearly all grew, and no replanting was necessary. As the plants began to break through (about June 1), the land was thoroughly harrowed, and they were cultivated and hoed for the first time June 15th. The hoeing was simply to destroy what weeds were not reached by the cultivator. They were again hoed and cultivated June 25th, the cultivating being nearer two than three inches in depth. Showers and winds so spread the tops that the crop could not be worked again, and "nothing was done but what any good farmer ought to be able to do when he wants to get an extra good crop. Half a tablespoonful of Paris green in a ten-quart pail of water, put on the vines with a fine sprinkler, destroyed the Colorado beetles, which came late, but in immense numbers. The early spring was favorable, but, from May 20th to June 10th, it was cold and wet, and then was rather dry until the potatoes were ripe," and with more rain the crop might have been larger. The potatoes were dug by hand with six-tined manure forks and weighed in sacks on Fairbanks tested scales.

Here we have a uniform soil, well filled with plant-food, and in fine mechanical condition. All of the four one-acre plots were treated alike, as before stated, except that they were manured differently. The manure, ashes, and fertilizers were broadcasted as evenly as possible after plowing, and were well worked into the soil by the subsequent harrowing. The result was as follows:

	The Manure or Fertilizer Used, and What it Supplied.				*Crop:*	
Acres.		*Nitrogen.*	*Phos. Acid.*	*Potash.*	*Bush.*	*Lbs.*
1	Ten cords well-rotted stable manure	24 lbs	20 lbs	20 lbs	404	39
2	Eighty bushels unleached wood ashes	00 lbs	48 lbs	192 lbs	454	48
3	Stockbridge potato manure, 1,500 lbs	52 lbs	173 lbs	105 lbs	454	56
4	Mapes potato manure, 1,500 lbs	60 lbs	180 lbs	98 lbs	426	16

The items of expense on each acre were the same, except for manure: Interest on land, $18; plowing, $2.25; harrowing, 75 cents; seed, $5; cultivating, $3.30; harvesting, $30; other expenses, $2.54. Add to these items the expense for plant-food, and we have, in Plot 1, manure $25, total expenses, $90.44; Plot 2, ashes (at seven cents per bushel and hauling) $7, total, $72.44; Plots 3 and 4, fertilizer, $30 in each case, or a total of $95.44 per acre. At 35 cents per bushel for the merchantable, and 10 cents for the small tubers, the balance for profit was, on No. 1, $45.69; No. 2, $81.10; No. 3, $57.83; No. 4, $47.40. The land was valued at $300, because adjacent to a city; the cost of harvesting was large, because of accurate weighing. The amount of plant-food supplied to the soil was in no case sufficient to supply the amount of the all three leading elements carried off in the crop, as the following comparison shows; the last column indicating what it would cost at usual prices of fertilizers to make good the loss after giving credit for what the soil gained in other instances:

	Nitrogen.	*Phos. Acid.*	*Potash.*	*Cost.*
Acre No. 1	Loss 30 lbs	Loss 36 lbs	Loss 126 lbs	$12 06
Acre No. 2	Loss 92 lbs	Loss 15 lbs	Gain 50 lbs	12.05
Acre No. 3	Loss 40 lbs	Gain 110 lbs	Loss 37 lbs	Gain .32
Acre No. 4	Loss 25 lbs	Gain 122 lbs	Loss 34 lbs	.23

The two fertilizers therefore added to the soil enough phosphate to make good the excess of nitrogen and potash carried off. But $12 worth of plant-food must be added to restore the deficiency following the use of manure, and quite as much where the ashes were employed, in spite of the excess of potash in this case. The cost per bushel, adding these charges, was 25½ cents on manure—18½, 21 and 22½ cents, respectively, on the other plots.

The striking lesson here is that this soil mainly needed the addition of a liberal amount of potash to produce a large crop of potatoes. The great yield with the ashes alone proves this; for it furnished nearly two hundred pounds of potash, a little phosphoric acid, and no nitrogen. It is probable, also, that such care in the selection of the sets planted as was practiced by Messrs. Coy or Rose would have helped the yield, for Mr. Smith notes that the plants came up "unevenly, though nearly all grew." With a soil so full of plant-food, it is also quite probable that the trench method of planting and manuring, as practiced by the two just mentioned, would have been better than broadcasting the ashes and fertilizers. Another great lesson is that where unleached wood ashes can be had within a mile of the farm for seven cents a bushel, they are a mine of wealth, especially for soils deficient in potash. If the lessons of this test are acted upon, and the land is again planted to potatoes, it will receive 100 bushels per acre of unleached wood-ashes broadcasted and harrowed in, 250 pounds per acre of special potato manure strewn in the furrow or trench after covering the seed, and 250 pounds more at the first hoeing. With vigorous sets of a thrifty and productive variety, Mr. Smith should average 500 to 600 bushels per acre if the season is favorable, at a cost of twelve to fifteen cents per bushel!

ANOTHER AROOSTOOK CROP.

A plan quite different from Mr. Coy's method was pursued by his neighbor, Delano Moore. The soil evidently was not as good, being a rather stony and gravelly loam, quite dry, and worth $20 per acre. It was cleared of hemlock, maple, and birch about 1882, pastured for five years, plowed in 1887 and sowed to oats, and in 1888 was planted to potatoes, receiving, for the first time in its history, a dressing of manure—about six cords per acre. Plowed the first week in May, eight inches deep, several days' work followed in digging, blasting, and picking up stones, after which it was harrowed and cross-plowed on May 23d. Two tons of Quinnipiac potato phosphate were sown broadcast the next day, and harrowed in. The land was furrowed out into trenches six inches deep and twenty-seven inches apart, into which half a ton per acre of the phosphate was strewn. The sets were dropped about sixteen inches apart, and carefully covered with about two inches of soil. Out of the nearly 15,000 hills, only twenty-seven required replanting. Dakota Red potatoes, from the second crop in that section, were planted. They were taken direct from the cellar, and medium-sized tubers (none smaller than a pullet's egg) were planted whole, twelve and a half barrels of seed being required. The only exception was six pecks of larger tubers that were cut in two crosswise. The average weight of 100 sets was over fourteen pounds, while the weight of 100 sets cut to one or two eyes is generally only four or five pounds. The field was lightly harrowed before the plants were up, which was within two weeks of planting. It was cultivated with a weeder on June 11th, and half a ton more of the fertilizer was strewn along the rows, and worked in when the acre was well cultivated, on the 20th, at which time the filling of the trenches was completed. It was again cultivated on the 25th, hoed on the 26th, cultivated on the 28th, and hand-cultivated on July 6th, the tops being then knee-high.

It seems that we were in error in stating that the blight failed to visit Aroostook, for it did appear late in August, and killed all vines except those of the Dakota Red. The later plantings of this variety finally succumbed, Mr. Moore's among the number, though crops that were two weeks earlier escaped uninjured, as in Mr. Coy's case. While the yield on Mr. Moore's acre reached 523 bushels, it might have been more if the vines could have had two or three weeks more for completing the maturing of the tubers. But it is evident that the planting of whole seed and excessive fertilization (three tons of phosphate on the acre) caused the growth to run too much to vine. Comparison with the experience of other contestants in this region affords strong grounds for the belief that had only one, or at most one and a half, ton of fertilizer been used, and the tubers cut to two eyes (only those of great vitality being planted), the yield might have been much larger.

Mr. G. W. Moore, in the same town and similar soil, made 402 bushels, with only one-tenth as much (600 pounds) of the same fertilizer, although his crop was also planted late. He used four barrels of whole seed and three barrels of fair-sized tubers, cut in two, and if cut to two eyes might have done better. Moreover, the latter's crop paid a profit of fully thirty dollars, at twenty-five cents for the good and ten cents per bushel for the small tubers, while the former's crop cost far more than it came to, even after making due allowance for harvest expenses. This 600 pounds of phosphate supplied all the phosphoric acid the crop of 402 bushels took from the soil, but failed, by sixty-five pounds of nitrogen and ninety pounds of potash, to supply enough of these two elements. For fifteen dollars these quantities could be returned to the soil, leaving a fair profit for the crop after adding this item to the expenses. The three tons of phosphate used by Mr. Delano Moore added to the soil seventy pounds of nitrogen, 525 pounds of phosphoric acid, and 167 pounds of potash more than the 523 bushels took from the soil, worth about sixty dollars. If this is credited to the crop, it, too, shows a profit. But practical farmers cannot afford to put on one acre fifty or seventy-five dollars' worth of expensive commercial fertilizers more than the crops grown will take off. It is cheaper to put on as much as is necessary to grow a fair crop, and repeat the operation next year.

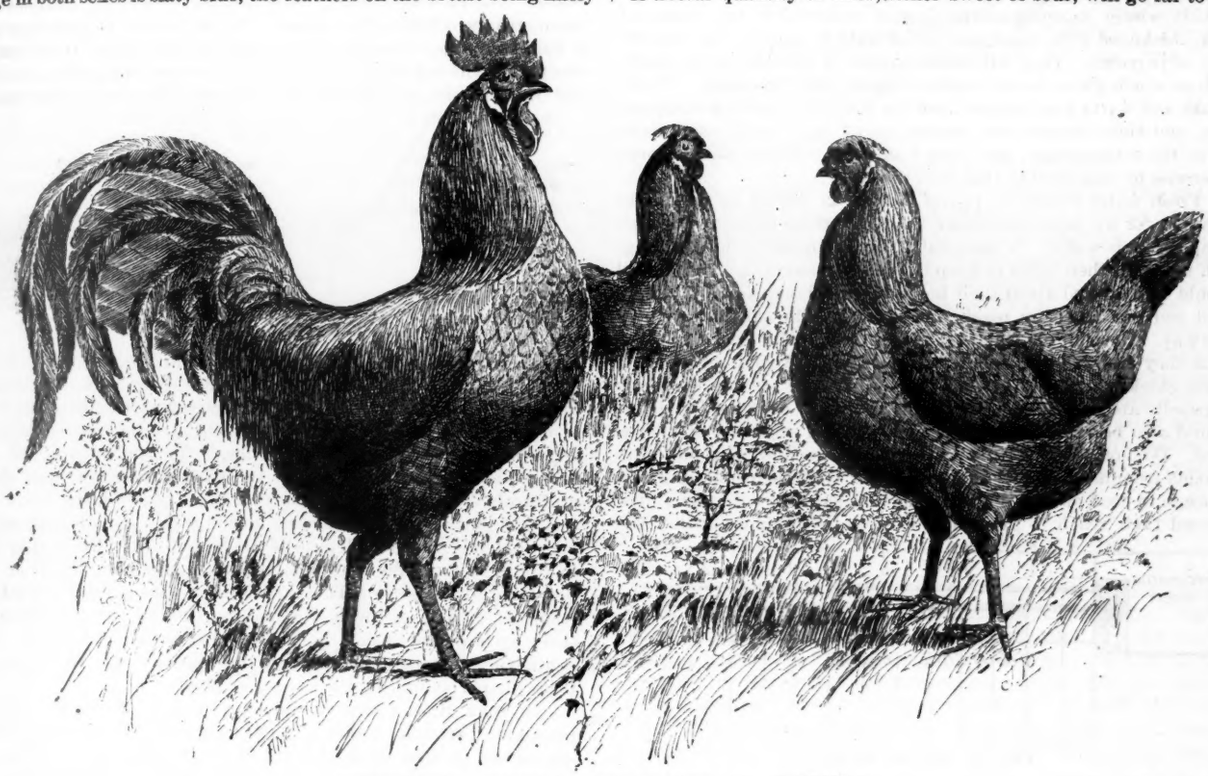
Guarding Against Dust.—Care should be taken in the matter of sweeping to cover up house plants, and to sponge the leaves frequently. The dust that accumulates on them shuts up their breathing pores, as it would on the human system, rendering them unhealthy. Another thing conducive to healthy plant-growth is frequent stirring of the soil, and a hair-pin is a good implement for the purpose.

BLUE ANDALUSIAN FOWLS.

The Andalusian breed, of which a trio is shown in our illustration, belongs to the Mediterranean division of fowls, which also includes the Spanish, Minorcas, and Leghorns. There is a tradition in England that the first Andalusians in that country were imported from Spain in 1851. Whatever may be the facts in regard to this, it is certain that they have been crossed with other breeds subsequently to the date given. In fact, many fanciers are of the opinion that the Andalusians were "made up" by crossing black and white Minorcas or black Spanish with a possible dash of Dominique Leghorns. But the Andalusian has become recognized as a distinct and well-established breed. The fowls present a unique combination of the true Spanish form with a color rarely seen in other pure breeds. In size, form, and general appearance, except the colors of the plumage, beak, and legs, the Andalusians strongly resemble the Minorcas. Like them, the comb is single, rather large, deeply serrated, upright on the males and drooping to one side on the females. The face is bright red, showing but little above the eyes; ear-lobes white. The beak, shanks, and toes are slaty blue. The general color of the plumage in both sexes is slaty blue, the feathers on the breast being finely laced with a darker shade, and the hackles, saddles, wing-coverts, and sickle feathers of the male very dark blue, approaching to black. Andalusian hens are very prolific layers of large, smooth, white eggs. They are very little given to sitting, and when one becomes broody and is given a nestful of eggs, she is quite likely to change her mind in a few days, leaving her charge in a condition which is neither eggs nor chickens. But when one perseveres to the end and brings off her brood, she makes an excellent mother, though she is quite likely to resume laying regularly while the chicks are still following her. They soon become accustomed to it, and wait curiously and patiently until the egg is deposited and the spasm of cackling subsides into the maternal cluck, when they run to the sheltering wings, or follow the hen, as if nothing unusual had happened.

The Andalusians are interesting to the fancier for their beauty and peculiarities of color, and to the practical poultry-keeper for their vigor, laying qualities, and early maturity. Like all Mediterranean breeds with large, single combs, they require protection from extreme cold.

The chicks are very precocious, feathering out while very young. The little cockerels begin to crow at an age when those of most other breeds are still in the down. They are also very pugnacious, although their infantile disputes rarely end in very serious bloodshed. As broilers they are unsurpassed. They are fit for the gridiron at an earlier age than many Asiatic breeds, and the flesh has a delicate, gamy flavor. The Andalusians are peculiarly well-adapted to the Southern States, but will also succeed well in the North with proper care and winter protection.



TRIO OF BLUE ANDALUSIAN FOWLS.

FEEDING FARM-POULTRY IN COLD WEATHER.

MRS. H. C. DUDLEY, KENTUCKY.

Wheat, oats, buckwheat, and barley are excellent egg foods, comprising many of the essential ingredients; and nothing is better for poultry than wheat screenings, which contain a variety of seeds, such as nature furnishes the fowl in its wild state. Meat they should have once every day during winter, to take the place of the insects which they enjoy so much in summer. Fresh meat is preferred, and should be given raw, cut into pieces small enough to be readily swallowed; when fresh meat is not convenient, however, bacon may be substituted, the refuse portions of which, and even the skins and rinds of old bacon, are eagerly devoured. It should be boiled till tender, chopped fine, and mixed with their soft food. A liberal quantity of milk, either sweet or sour, will go far toward taking the place of meat, but it should not be substituted entirely if the fowls are to be kept alert and cheerful in spite of the severe cold and the penetrating winds of winter. Milk also contains a large proportion of albumen, which enters largely into the composition of an egg.

Fresh vegetables, or some kind of plant-food or provender, should also be given them once a day. To take the place of green food give such vegetables as cabbage, turnips, and onions raw. Others, as potatoes, beets, and carrots, are best boiled, and mixed with ground oats, wheat, bran, and corn-meal. All soft food should be seasoned with a pinch of salt; a pod of red-pepper now and then. As the food of even unconfined farm-poultry is limited in winter almost exclusively to what is given them, we must be careful not to have their diet too concentrated. If a hen is observed during summer, it will be seen that she is eating something all day long, though this something is often what appears to us to contain but little nutriment. Finely-cut clover hay, especially if it be scalded, and a small quantity of bran mixed with it, forms an excellent provender. Induce the fowls to keep up their active habits. They are busy, energetic foragers. Scatter their grain among chaff or leaves so as to make them scratch for it. The oft-repeated saying, "Give a hen as much as she will eat up clean," is a most pernicious one. Her appetite is no index whatever to the amount that is good for

her, it being her nature to eat as long as there is anything in sight. If allowed to gormandize, she will sit down in a corner and mope, and next she will have the cholera. Under-feeding is better than over-feeding. To be healthy, fowls must be all the time looking for the next mouthful, and the greater the variety afforded them the better they will thrive.

In winter, fowls should be fed three times a day. Give them a good warm mess of some kind early in the morning. Throw them some kind of small grain, where they will have to work for it. At

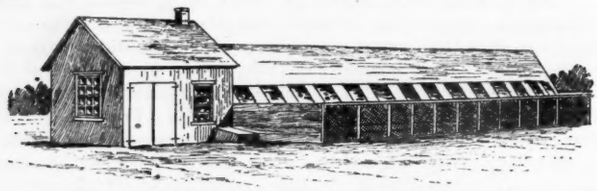


FIG. 1. PERSPECTIVE VIEW OF BROODER-HOUSE.

noon give them boiled vegetables, thickened with meal and wheat-bran, and at night a liberal allowance of whole grains of corn. On a chilly winter morning carry them a bucketful of hot skimmed milk, thickened with meal, and boiled until it assumes the consistency of porridge. They will crowd around it and discuss its merits with as much gusto as we would a cup of nice chocolate. Warm drinks and warm food help to keep the body at a uniform temperature, and thus increase the production of eggs, while cold foods lower the temperature, and thus lessen the vitality which would otherwise be expended in that direction.

Fresh water should be provided them in winter as well as in summer, for we must remember that over three-fifths of an egg's composition is water. A spoonful of lime dropped in the drinking-dish now and then helps to keep it pure and sweet, and a handful should be scattered about their house and yard occasionally. Keep sand and gravel within reach, and utilize all the old plastering in this way. Burn all the bones taken from the fresh meat in the oven until they crumble and can be broken or ground, and throw them to the chickens. Bones contain much carbonate of lime, of which egg-shells are composed. The shells of all the eggs used at home should also be crushed, past recognition, and scattered about the yard. Do not throw soft food upon the ground, but put it in wooden troughs or on bits of wide board. Give them a head of raw cabbage to peck once in a while, and tie a sheaf of oats just a little beyond their reach to give them exercise in jumping at it. And

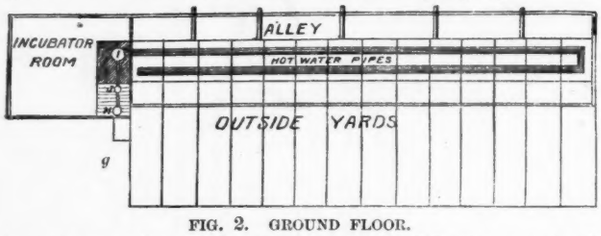


FIG. 2. GROUND FLOOR.

when winter apples are picked over save the defective ones for the chickens. All these things, however, should be given them in moderation. Remember to keep their dust bath where it will keep dry and be always convenient, and if a spoonful of powdered sulphur or a small quantity of insect powder be sprinkled into it the fowls will keep themselves free of parasites.

The advantage of raising poultry on the farm is that we do not have to buy any food for their especial use, but can take a little toll from that which is raised for the rest of the stock. For instance, the seed from the sorghum grown for the cattle is the very thing for the poultry. In fact, an almost infinite variety may be gathered up here and there about the place, so that there is no excuse for the farmer's wife falling in to the popular error of feeding her flocks corn, and corn alone. In summer they should have no corn at all, and in winter corn should be one-third only of their daily rations.

Ventilation for Stables. — The old-fashioned barn, with a broad thrashing floor in the middle, stalls and granary on one side, and a hay-mow on the other, is not a very high type of rural architecture. The cracks which admit the light, also let in the cold air. Yet rude as is such a shelter for horses, it is more healthful than some of the modern, elaborately-finished stables which lack plentiful ventilation. A horse cannot retain health and vigor in a hot, foul, unventilated stable. Elegant fittings and interiors "handsomely finished in the natural wood," do not make up for the want of pure air. It should be supplied in such a manner as to avoid direct draft on the horse. A very good system consists of horizontal pipes perforated with fine holes, opening outside, and extending just above the mangers, with vertical tubes from the ceiling to a ventilator in the roof.

INCUBATOR- AND BROODER-HOUSES.

W. H. HOPPING, NEW JERSEY.

At Hammonton, New Jersey, two systems are in operation of hatching chickens, and caring for the downy little things after they come out of the incubators. One method is to use a long building, like the one illustrated herewith. Fig. 1 is a perspective view, Fig. 2, the ground plan, and Fig. 3, a sectional view. The incubator-room, stove, and boiler occupy the main structure. By the other system, a hundred chicks are placed in a small brooder, which is set in a small enclosure, the heat being supplied by lamps. The former has many advantages, as the heat may be furnished either by lamps or hot-water pipes, and there is no exposure to stormy weather. Fig. 2 shows clearly the internal arrangement of the incubator and brooder-house. The incubator-room, with heating apparatus, occupies the main structure, fifteen feet square. In one corner is a pit, four and a half feet wide, eleven feet long, and six feet deep. One half of the pit, in which is situated the stove, *i*, is open, the other part, containing the boiler, *j*, is floored over. A barrel, *h*, is kept full of water,

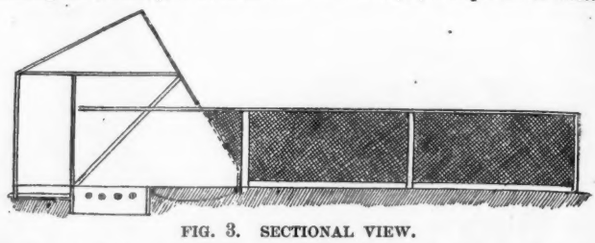


FIG. 3. SECTIONAL VIEW.

and elevated above the floor, giving pressure to the water in the stove. At *g* is a coal-house. The brooder-room, seventy feet long and twelve feet wide, is divided by screens of wire netting into fourteen compartments, each five feet wide, and having capacity to accommodate two hundred chicks. The north wall of the brooder-house is six feet high to the eaves; the south wall slopes uniformly from the peak of the roof to the ground, the lower five feet being made mainly of sliding glazed sash. An alley, three feet wide, extends the entire length of the house. Next to the alley, and in a pit under the floor, are the hot-water pipes leading from and returning to the stove. The partitions of wire-netting extend sixteen feet outside of the house, making each of the compartments three by nine feet inside, and three by sixteen feet outside. Five ventilating tubes extend through the opposite side of the house, from the pit containing the hot-water pipes.

In each little compartment immediately above the pipes is placed an "artificial mother." They are each thirty-one by thirty-six inches, of inch board, raised three or four inches above the floor, on pegs at the corners. From the edges of the board hangs a strip of felt, reaching to the floor. A short tube through the floor admits warm air from the pit beneath, which contains the hot-water pipes. From the edge of the pit to the outer sill of the building the earth is excavated to the depth of a few inches, a screen of fine wire-netting is put down covering the entire surface, and a few inches of sand thrown on top of it. This is to exclude the rats, and

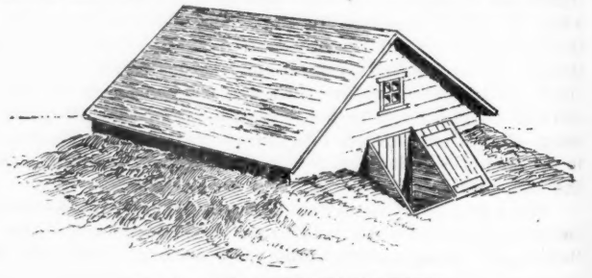


FIG. 4. CELLAR INCUBATOR-HOUSE.

is done before the floor is laid. A small aperture in each compartment, beneath the sliding sash, affords egress for the chicks to the outer yard.

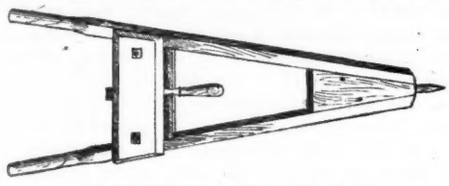
Fig. 3 is a cross-section of the brooder-house. At the left is the alley, then the floored run, with the hot-water pipes beneath, and a

ventilating-tube; and beyond the sash the wire-enclosed outside runs. Beneath the floor the dotted line from the hot-water pit to the outer wall represents a fine wire-netting covered with sand.

Fig. 4 illustrates a cellar incubator-house, which may be used as an adjunct to the one described above. An excavation is made twelve feet square and five feet deep. A cedar post, eight feet long, is set at each corner, and an intermediate one on each side. Inch-boards are nailed to the posts inside and out, from bottom to top, a window and doors put in, and the whole covered with a shingle roof. In the dry, sandy soil of New Jersey no drainage is needed.

REST FOR A GRINDSTONE.

If the stone is out of proper circular form, it should be turned off by holding a piece of wrought iron, such as an old bolt or piece of bar iron, flat on the bench, keeping it firmly in place; not letting it work in or out, but wearing off the high places until the stone is uniformly concentric with its axis. If the stone loses its sharpness of grit and does not grind well, it is because the pores have become filled with particles of steel, which can be removed by the same process as above, using soft wrought iron. The rest shown in the engraving is for holding in the right position the article to be ground, so as to grind it to a uniform bevel. For making the rest, take two strips of hard wood six feet long and one-and-a-half inches square; place the ends one inch apart at one end, and two feet at the other. Cut a piece of wood an inch and a-half thick and ten inches long, so it will fit the narrow end. Cut a similar one six inches wide, and long enough to go eighteen inches into the wide end, and nail firmly together, having the frame, when together, even or flush on both sides. Bore a hole in the middle of the narrow end piece, and drive in an iron pin having a sharp point, projecting about an inch. An old three-cornered file is the best for this purpose, leaving the tang out. Then place a piece of hard wood, half an inch thick and six inches wide, over the long cross-piece, fastening it



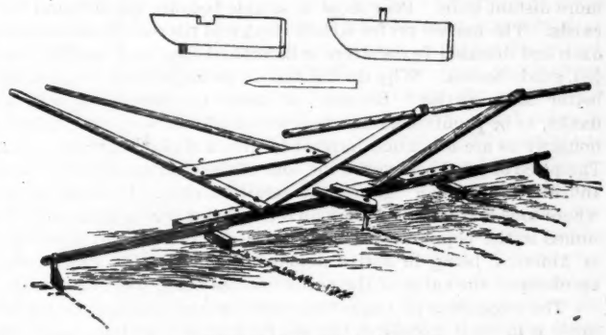
A CONVENIENT GRINDSTONE REST.

there by putting a two-and-a-half-inch screw through both ends into the side strip, letting this piece project out about an inch beyond the side strip. Round off the corners of the projecting ends of the side strip for handles. The half-inch hard-wood cross-piece is used as a clamp, placing the article to be ground between that and the cross-piece, and tightening by two screws. Place the stone near the side of a building or post, far enough away so that the sharp point in the narrow end of the holder can be stuck in the post, and bring the article to be ground in its proper position above the stone. The pointed end can be raised or lowered to fit the bevel of the tool to be ground, and also to allow of its being moved sidewise on the stone. The person using it needs only to guide it and give it the necessary pressure by taking hold of both handles.

The stone should have a water-box placed under it, and fastened to a leg of the frame, coming high enough to allow the stone to rest in the water when in use. The box should have a plug near the bottom, to let the water off when not in use, as it injures the stone for one part to stand in water, causing it to wear away unevenly, and to freeze up in winter.

HOME-MADE CORN-MARKER.

We illustrate herewith a very convenient corn-marker, from sketches and description furnished by N. E. Teels, Erie Co., Pa. Any farmer can make it during the wintry days. It is free from the excessive weight which makes many other similar implements clumsy and difficult to handle. The largest stick in it is a piece of scantling four inches square, eight-and a half feet long. This is of whitewood or pine. To this are bolted two peeled hemlock poles, ten feet long, of suitable size for shafts. The large ends are beveled to give the correct upward slant. A cross-bar of inch-board ten inches wide is bolted to these shafts three feet from the lower ends. Two hooks are set into this, to which the horse may be attached. The runners are each made of plank, two and a half inches thick, six inches wide, and two feet long; rounded up at the front like a sled-runner. A notch, half an inch deep, admits the bed-piece. A half-inch bolt is firmly driven into the middle of each notch in the runner, projecting five inches, with a screw-thread cut on the upper end. This bolt is to project through a half-inch hole bored for the purpose in the bed-piece, and a nut and washer fastens it. The middle marker is a cultivator-tooth set into a stick three by four inches, twelve inches long, loosely bolted between two pieces of similar size, each eight inches long, which are halved and firmly bolted to the bed-piece. On each side is a tracker to aid the operator in maintaining uniform distance between the rows. Each tracker is of pine or whitewood, five feet long, two inches thick, and three inches wide at the large end, tapered to two inches at the other

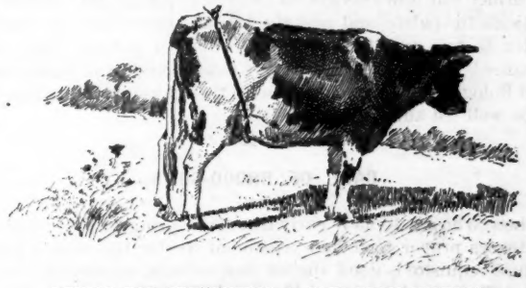


A SERVICEABLE CORN-MARKER.

end. A half-inch hole is bored in the large end for the bolt which holds it to the bed-piece. At the small end is a row of five holes to permit the shoe to be adjusted at different intervals. The shoe is of any tough, hard wood, shaped as shown in the engraving. Securely bolted to the top of the bed-piece are two sticks of hard wood, three and a half feet long, two and a half by three and a half inches, beveled at the lower end to admit of standing at the proper angle. Three inches from the top of each is bored a hole, through which an old rake-handle is thrust, to serve as a handle for the marker. The two trackers and the middle marker can be turned over on the top when not in use. In the upper part of the engraving are shown at the left the marker used for hand-planting, with a section of the hard-wood shoe beneath. At the right is the form of runner used to mark for machine-planting.

TO RESTRAIN A COW FROM KICKING.

Our illustration shows a method of restraining a kicking cow which is furnished us by Mr. S. B. Strout, Conecuh Co., Alabama, who writes us that he has used it successfully for many years and never known it to fail. It is so simple and easy, and so quietly applied, that the cows do not seem to resent it as they do if tied head and foot, as some seem to think necessary. A small rope or large cord is passed around the body of the cow just in front of the udder and over the top of the hips. It need not be drawn tight, just snug



DEVICE FOR PREVENTING A COW FROM KICKING.

will do, and no cow to which it is applied will even kick. Sometimes a cow thus tethered will lift a foot as if to kick, but somehow she seems to change her mind and puts it down again.

Value of Salt for Milking-Cows.—An experiment made the past summer with our cows proved that when a handful of salt, or about two ounces of it, was given every day, the yield of butter was increased one-fifth; and when salt was withheld the yield fell off in the same proportion. The reason, beyond question, is that as salt is required for full digestion of the food, more of the food was changed into milk. Keep rock-salt within reach of the cows.

THE AMERICAN BEEF SUPPLY.

MIDY MORGAN.

The question, "When shall we get better beef?," which was discussed in a recent issue of the AMERICAN AGRICULTURIST, is one that comes home to the teeth and stomachs of all the people. The evils complained of are more widespread than the public generally believe. Why are the herds of the United States in a bad condition? Why is their health doubtful? Why is poor meat salable? The herds of our country represent, in the aggregate, quantity not quality. Their health is under suspicion, because owners are short-sighted and look for the ready profit rather than the greater but more distant gain. Poor meat is salable because the demand for it exists. The masses prefer sirloin steak and rib-roast from worn-out oxen and diseased Texas steers to flanks and chucks of healthy, corn-fed, grade beeves. Why do the masses prefer to feed on meat little better than carrion? Because of their ignorance. Chucks and flanks, to be profitable, must be scientifically cooked, and American housewives are too much hurried to give a studied care to cooking. The price of good beef vexes the soul of the economical housekeeper and raises his anger against the retail butcher. In Great Britain, where tons and tons of American refrigerator beef are annually consumed in the populous districts, flanks and chucks are higher than in America, being in active demand, while sirloins and rib-roasts are cheaper, the value of the entire carcass being more equalized.

The suggestion of improving pastures and breeding better beef-cattle is in itself excellent, but the field is so wide that many influences must be brought to bear on it before more than a very gradual improvement can be looked for. Many causes work together to render the cautious buyer doubtful of the sanitary condition of our meat supply. The native grasses South and Southwest furnish the germ from which arises splenic fever. This caused the underwriters during all of last summer to refuse to insure American herds during ocean transit, save from three States: Ohio, Virginia, and Kentucky. Distillery-feeding develops "lump jaw," a disgusting disease, which cannot be detected after the head has been severed from the body. We believe that our flocks are in the main healthy, and although the decrease of 10,000,000 in our sheep within this decade is a step backward, the quality has been much improved and good mutton and well-fatted lamb are plenty in our large markets. It would be a general blessing if local production kept pace with local demand. It would save consumers from the ill effects attendant upon fevered and bruised meats. Herds slaughtered in Western centers for Eastern markets travel thousands of miles by train; herds slaughtered in our Eastern States travel hundreds of miles by train; in neither instance is there sufficient time allowed for healthy recovery. This injures the flavor and renders much of our meat supply distasteful to the fastidious. The lover of sausage-meat would have his gastronomic pleasures seriously interfered with if he knew and observed the sources from which flow his tid-bits. The consumer of these savory morsels pays well for old oxen and worn-out dairy cows. These latter sell at seven to twelve dollars per head and at one to two and three-quarter cents per pound. The former sell down as low as two cents per pound. Scrub bulls also tickle his palate and cost the manufacturer from one and one-quarter to two and three-quarter cents per pound. Oh! happy ignorance! Oh! folly to be wise! Take your Texas steak and so-called Bologna sausage, together with their accompanying headache, and be well fed and happy.

CARE OF BROOD-SOWS.

Those who are to have early litters of spring pigs must give the brood-sows proper food and treatment during the winter months. The first requisite is good shelter and a clean, wholesome sleeping-place. The next is a reasonable amount of liberty. It will not do to keep a brood-sow shut up continuously in a small pen, even if it is kept reasonably clean. She will become sluggish and inert, with none of the vigor and muscular stamina needed to produce and rear healthy pigs. A certain amount of exercise every day is necessary. If she will not take her daily "constitutional" of her own accord, it is best to drive her out. Nothing is better during mild, open weather than the run of a lot where she may root to her heart's content. Never put a ring in the nose of a brood-sow.

The food should be abundant, but not of a fattening character. Milk, bran, and middlings, with a small modicum of oil-meal, varied frequently by boiled turnips, carrots, beets, or other roots, clover-hay chopped short and mixed with the cooked ration, and in cold weather a small proportion of corn-meal, will keep the animal in good, thrifty condition. It is well to remember that swine are omnivorous, and an occasional morsel of animal food is always acceptable. The "lights," entrails, and other waste material of a slaughter-house, when attainable, are desirable additions to the animal's dietary. It is well to keep a mixture of salt, charcoal, and a little sulphur in a trough where the sow can help herself *ad libitum*. It is always best to keep brood-sows separate from the rest of the herd. This is specially imperative as the time for farrowing approaches.

CROSS-BRED POULTRY FOR THE MARKET.

MICHAEL K. BOYER, NEW JERSEY.

The most successful market poultry is that which is obtained by proper crossing. And what branch of the business pays so well as that which supplies the tables of the rich and poor? There is profit in breeding fancy fowls after a reputation has been achieved, but that costs money and time. Market poultry needs no reputation. All it requires is good common sense, and enough experience to run the business. The average farmer has these.

The writer has been severely criticised by some fancy breeders for his stand on crosses, but, as his aim is to benefit the market, he feels justified in his position. Besides, there is plenty of room for both fancy and market poultry. We need the fancier, by all means. We cannot produce crosses without pure-breds. There are two great points desired in the breeding of poultry—an increased production of eggs, and improvement for the table. These are the legitimate grounds which justify cross-breeding. In crosses we combine quality with size, as, for example, Houdan on Cochin or Brahma, or Cochin on Dorking. This latter cross is after the English fashion. They take a good two-year old Cochin cock and mate with six good Dorking hens of a year old. The pullets of the cross are next season mated with game, and their produce is then marketed. Thus they gain size from the Cochin, and quality from the Dorking. By the game cross very little in size is sacrificed, while another first-rate cross, in point of quality, is added. An Englishman, referring to this cross, once said: "The flesh is white as snow, and as savory as any aldermanic gourmand could desire." It must be understood, however, that nothing is gained by mating the progeny. Cross-bred birds should never be mated together. When we make the cross we have the ideal of our experiment; beyond that there is a downward tendency.

We do not believe any great success can be obtained in mating for increased egg-production. That is, no cross can be secured that will give a higher egg record than that which some of our noted strains now have. It is principally for an improvement of table quality that we recommend inter-breeding.

WINTER-KILLING.

PROF. A. A. CROZIER, IOWA.

Trees are injured in winter more than is generally supposed. The injury is overlooked from the fact that trees have a wonderful power of overcoming this injury. The cambium, or layer of young cells between the wood and bark, possesses the most vitality, and can longest withstand the effect of cold. The green outer bark may become ruptured and disorganized; the older wood within may have its remaining vitality exhausted, leaving only a "black heart;" the body of the tree may be rent by fissures in prolonged cold weather, but so long as the buds and a thin film of cambium retain their vitality, the tree will live, and, as spring approaches, the cambium, fed by the protected and well-stored roots, begins to grow and form new wood and bark, while the displaced cells of the older bark again fill with sap and settle into their places. The dead wood is made useful for carrying sap, the gaps in the trunk close up, and no one but the observing horticulturist ever knows what a hard time the tree has had of it. It is only when the tree, or a considerable portion of it, dies, that attention is generally called to it. The killing back of unripe twigs occurs in most trees nearly every winter, but the greatest danger in the coldest winters is from the killing of the body. This is the point farthest removed from the most vigorous centers of life, and contains the smallest amount of cambium in proportion to its mass. It is therefore the weakest point, and needs its additional thickness of bark. But in orchard-culture, in trying climates, this is not sufficient, and we often find, after severe winters, that the body is dead while both top and roots are alive. For this reason, low heads, and banking up with earth are recommended.

EGYPT AND ITS IRRIGATION.

FRANK G. CARPENTER.

Egypt is the daughter of the waters, and all of her voluptuous luxuriance of life she owes to the mighty Nile which flows through her. Bedded in sand, and bounded by deserts on either side, she lives only where the waters of the Nile touch her, and she stands before the world as the greatest miracle of irrigation.

FIG. 1. AN EGYPTIAN SAKIYEH.

Think of a region as black as your hat, and as rich as guano, which for ages has produced its three crops every year without fertilization. Let it extend a thousand miles long and make it, for nine hundred of these miles, be only three to nine miles wide. Put at the end of this nine-hundred-mile-handle a great fan-like delta, and you have the Egypt of to-day. On both sides of this fan and its handle are the bleakest and most barren of sands. The soil itself, in no place more than thirty-five feet deep, rests upon sand, and this same sand crops out on the east into the millions of acres of desert, and on the west into the vast expanse of the burning Sahara. These two line the sides of the valley along the thousands of miles of its course, framing its living green in white walls of glowing sterility.

The irrigation of Egypt is now conducted on a scientific basis. The whole country is cut up into canals, and there are immense irrigating works in the Delta, which, during the inundations of the Nile, require hundreds of thousands of men to manage them. I met, during my visit to Egypt last summer, the manager of the immense dam which extends across the Nile below Cairo, and which raises its waters into a vast canal, through which they are allowed to flow out into subordinate canals over the great Delta. There are some steam-pumps used in Egyptian irrigation, but by far the greater part of the country is irrigated now as it was in the days of the Pharaohs. This is by means of the shadoof and the sakiyeh. All over Egypt you will see men naked to the waist standing knee-deep in the water with a basket-work bucket hung by ropes between them. With a swinging motion, they scoop the water from the river into this bucket, and swing it up to a canal on a higher level, from whence it runs off into the fields. The water is often drawn from this canal into a higher canal in the same way, and thus, by a series of planes, it is conducted so that none is lost. The sakiyeh, one of which is illustrated in Fig. 1, is run by a donkey or oxen. There are more than fifty thousand of these in Lower Egypt, and it takes two hundred thousand oxen and one hundred thousand persons to manage them, and it is estimated that they irrigate a territory about as large as the State of New Jersey. They are pumps of the rudest possible description. A vertical wheel of about thirty feet in diameter has a number of earthen pots tied to its tire, and it is moved by a horizontal wheel at the top which fits into it by cogs. The animal, fastened to a bar, and with his eyes blindfolded, turns this horizontal wheel around and around as he goes in a ring, and as the vertical wheel rises, it lifts the water from the well or canal, and when it passes the perpendicular, throws it into another canal, whence it is carried over the fields. These methods of irrigation are also in use in Upper Egypt, and the fellahin or peasants do not care for modern inventions. Ismail Pasha, the last Khedive, was an advanced farmer, and he introduced a great amount of improved agricultural machinery, including many patent iron pumps. The most of these are now rusting for want of use, and the farmers have gone back to the shadoof and the sakiyeh. After the water is taken out of the great canals, it is spread over the fields in little ponds, and the flat fields are often divided into small squares by means of embankments of earth one foot in height, which run around them like fences, and which can be opened or closed to regulate the height of the water within them. The rising of the Nile begins in June, and during the summer much of Egypt is one vast lake. It remains so through September, and it subsides toward the latter part of October. It is at this time that the water is conducted into this vast network of canals, and is carefully carried over the cultivable lands. The crops of much of Egypt depend entirely on the size of the inundation, and when there is a low Nile, Egypt is afflicted with famine. Last year the water was very low, and the peasants and the farmers had a portion of their taxes remitted on this account. The crops were so short that the salaries of the government officers had to be reduced, and the Khedive and his family received only ninety-nine per cent of their usual allowance. It is said that the irrigation of

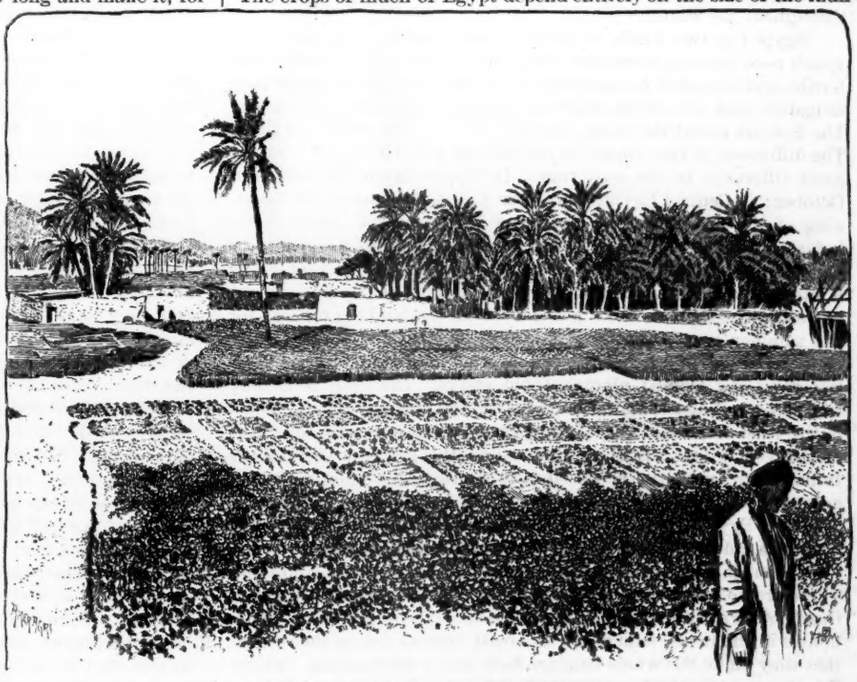


FIG. 2. EGYPTIAN FARM IRRIGATION.

the Egypt of the past was better than that of to-day, and there is an American who has a scheme which it is thought will release the country from the dangers of a low Nile. This American has discovered a depression in the desert near Cairo, which he says was once the bed of a vast lake, and he shows, by references to the ancient works upon Egypt, that this was once a grand irrigation reservoir. Herodotus thought it compared with the Pyramids as one of the wonders of the world, and he says it was filled by the Nile when high, and saved until a water famine came, when it was let out upon the land. The Egyptian government has taken this matter in hand, and though they first laughed at the American's scheme, they consider it to be now a feasible one. They have surveyed the country leading to the dry lake, and it is found that a canal eleven miles long will fill it. If this is done, a vast amount of fertile soil will probably be added to Egypt. Experience has shown that this desert will blossom like the rose if it can be fed with water, and the fresh-water canal near Suez brought five hundred thousand new acres under cultivation. Scientific irrigation would increase her farming products ten fold.

The farming implements used are of the same pattern as those used in the days of the Pharoahs. I went down into the tomb of Ti, under the desert above Cairo, and near the site of ancient Memphis. Ti was a great nabob about four thousand years ago. He built himself a number of subterranean chambers of granite, and adorned their walls with paintings illustrative of the customs of the time. Here I saw pictures of the shadoof as used to-day, and beside these are paintings of men plowing, showing that the Egyptian plow of 1890 is precisely the same as it was when Moses was a baby. It consists of a pole or tongue about six feet long fastened to a piece of wood bent inward and shod with a three-pronged piece of iron. Affixed to the pole is the handle which is held by the farmer. He holds it with one hand, and he has a stick in the other. The buffaloes or bullocks are fastened to the plows by yokes, and I saw no plowing in harness. One of these plows, with its team, is shown on the first page. These plows merely scratch the ground. But they seem to serve the purpose. The winter crop of Egypt, which is sown immediately after the inundation, is spread over the ground without plowing. The seed is tramped into the moist earth by oxen, or rolled into it with a wooden roller, and it is wonderful how it grows. I paid my first visit to Egypt about eight years ago, and I arrived in Alexandria on the first of January. The whole country was as green as Ohio in June, and it keeps this luxuriant greenness throughout the winter.

Egypt has two kinds of lands. One is made up of those soils which need nothing more than the yearly inundation to make them fertile, and the other is composed of the lands which are artificially irrigated, and are given water throughout the different seasons. The first are called Rei lands, and these form as the water subsides. The difference in the climate in the various parts of Egypt makes a great difference in the seed time. In Upper Egypt, this begins in October; in Central Egypt, and about Cairo, it comes at the beginning of November, and in the lower Delta the soil is not ready before December. In about four months, the crops are ready for harvest, and the winter harvest is the chief one of the year. The winter crops consist chiefly of wheat, barley, beans, and clover, and almost as soon as these are harvested, the land is prepared for the summer crop. This crop is raised chiefly on the lands artificially irrigated, and it consists of tobacco, rice, vegetables, and cotton from the pruned plants of old stalks. The crop is usually harvested in August, and after it comes the autumn season, which is the least important of the Egyptian farming seasons, and lasts only seventy days. Still, in this season the greatest part of the Indian corn of Egypt is raised, and maize ranks next to wheat among the Egyptian grain crops. At the beginning of October the delta of Egypt looks like the great cornfields of Kansas and Nebraska, and the whole country takes on a new beauty.

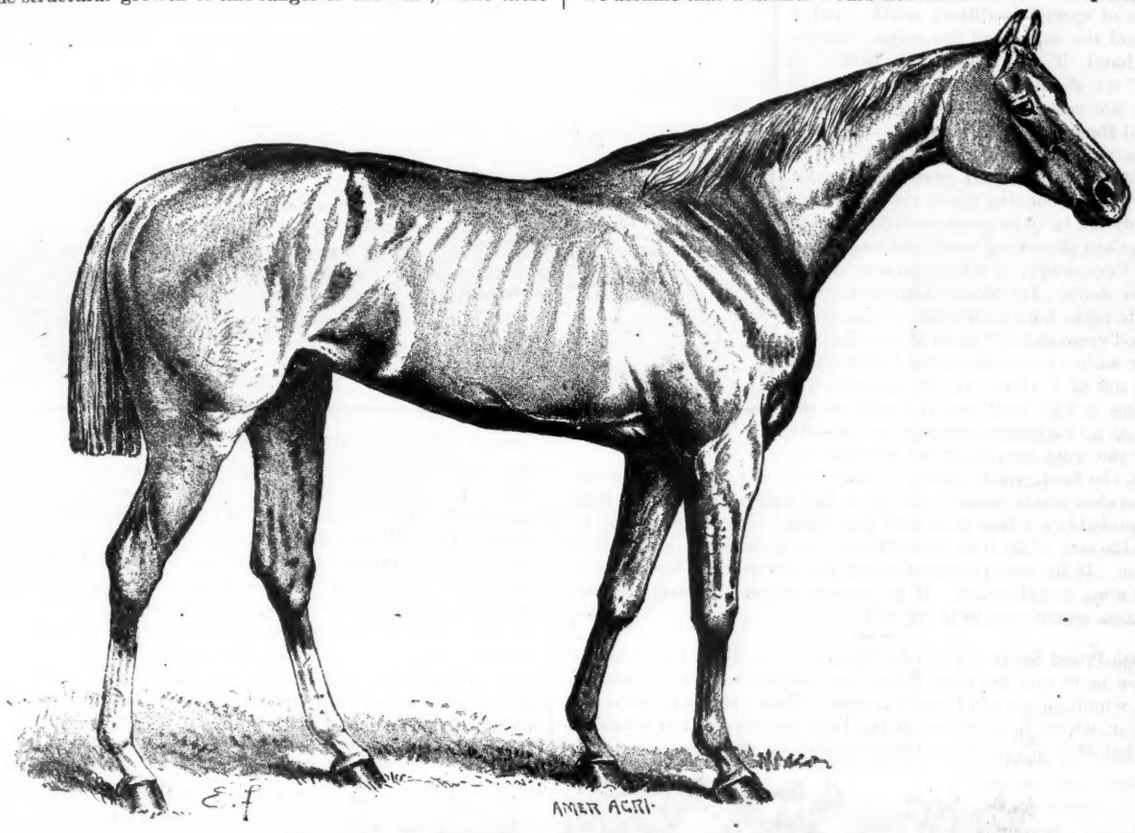
I can hardly describe the beauty of an Egyptian landscape. There are no fences, and the farms and fields are separated only by the character of the crops and the canals. There are no barns nor houses in the fields, which are so small and so rich in their crops, that they make the whole country look like a vast garden. Everything grows like the famous gourd of Jonah. The patches of clover bend their heads over with the weight of sweetness, the cotton in the next patch bursts forth in its pods of whiteness, and beds of heavy green point out the rich coming harvests of beans. There are few trees to be seen, only here and there a cluster of tall palms marks the site of a mud farming village, and a grove of date trees reminds you that you are in the tropics. Fig. 2 shows a characteristic farm-scene in Egypt. The fields are free to all. You may ride anywhere on your donkey, being careful to go along the edges of the crops, and you will find few wide roads, and, away from the cities, no carriages or wagons. I venture to say that there are not one thousand wagons in the whole land of Egypt. Camels and donkeys are the beasts of burden, and bullocks and buffaloes are the chief farm animals. Even carts are a rarity. Camels carry the heavy loads, and you see everywhere their great outlines in the blue sky, against the background of the desert (see frontispiece). They will carry as much as a horse can haul, and when loaded with grass or hay, the bundles are so great that only their legs peep out below, and it looks as though the burdens were walking off bodily. It is the same with the little donkeys, many of whom are not larger than a good-sized Newfoundland dog. They are loaded so that only their legs show, and are driven in single-file across the country, carrying the crops to market. They have no harness, no halters, or pack-saddles, and the farmers who drive them are bare-footed men in a single gown of blue cotton. An ordinary donkey can be bought for from ten dollars upwards. Camels are more expensive, and range in value from thirty dollars up to one hundred. The last, however, is the price for a riding camel, and it may be interesting to state that camels have their gaits just as do horses, and there is quite as great a difference in their endurance and speed.

Most of the riding in Egypt is done upon donkeys. The Egyptian rides him usually without a saddle, and guides him with a stick, instead of a bridle. In the cities the merchants, and in the country the rich farmers, have men or boys to follow behind and whip up their donkeys, and these, in order to lighten their labors, not infrequently knock off a piece of bare skin, the size of a silver dollar, and use this as a spot into which to poke their goads in order to make the donkey go. The Egyptian knows nothing of Mr. Bergh and the Society for the Prevention of Cruelty to Animals, and he does not acknowledge that the donkey has any rights that he is bound to respect. There are no horses to speak of in Egypt, but the mules and breeding asses, many of which are brought from Arabia, are very fine, some bringing prices as high as five hundred dollars apiece.

The farming population of Egypt, notwithstanding they have the richest soil on the face of the globe, are among the poorest of their class. Their holdings are small, and they are taxed to death. They are happy if they can get the bare necessaries of living, and their homes in ninety-nine cases out of a hundred are huts, made of dried sun-baked bricks and huddled together along the unpaved streets of a village. These huts are square or rectangular in shape. They are seldom more than seven feet in height, and their roofs are flat. The live-stock of the family often takes up a part of the room, and goats, and cows, and donkeys, and men, and women are crowded into one little room. The wife of the farmer works as well as her husband, and, though she must wear a veil over her face to keep other men from seeing her, she carries all of the water for the family from the Nile on her head, and provides the fuel for the family by gathering the soft droppings of the camels and the cows, and patting them into shape with her hands to lay away and dry in the sun. She cooks without a stove, and the people live on the cheapest of food. They know nothing of the beauties of Nature, and they have neither gardens nor flowers. The houses are so closely huddled together that you could plant an Egyptian village of five thousand people on a twenty-five-acre field. You would hardly consider the houses of the town fit places for your hogs, and you certainly would not trust one of your blooded horses or registered shorthorns within them. Farm wages are scarcely life-supporting. In Upper Egypt there are thousands of men bending all day in raising these Nile-eaters, who receive from five to seven cents for working from sunrise to sunset, and about the great city of Cairo I am told that the average of farm-labor is not more than twenty cents a day. Such of the farmers as own their lands can do no better. Their farms are not more than one or two acres in size on the average, and six-sevenths of all the people of Egypt live by farming. Taxes range from five dollars an acre upward, and there are import taxes, export taxes, and taxes on all kinds of produce at the city and village gates before they can be brought into the market and sold. The national debt of Egypt is to-day nearly as large as that of the United States, and the average of the burden supported by this poverty-stricken agricultural population is more than $425 a family. Still, Egypt has been selling for years more than fifty millions of dollars' worth of her produce per annum to the nations of the world, but her surplus goes to her rulers, and the bankers of Europe grow fat on the life-blood of the land of the Nile.

SPOKANE, THE MONTANA THOROUGHBRED.

We recently published a portrait of El Rio Rey, one of the great two-year-old California-bred race-horses, whose precocious development was doubtless largely due to the system of early care and feeding. Spokane, the subject of our present illustration, has been brought up under singularly different surroundings. In him our readers can study the lines of a great horse, though not endowed with more than usual beauty. Spokane was bred in Illinois; from whence, in his very early days, he was taken to Montana; there, in the fields of the Northwest, this high-born colt "rustled" with less noble horses and came out as a two-year-old with an amount of lung-power never possessed by horses bred and raised in lower latitudes. Spokane as a three-year-old, and when first he contended in the great three-year-old stakes, filled his admirers with wonder. The ease with which he won, the marvelous efficiency of his breathing organs, and the easy, regular flow of his circulation, rendered it a facile task to put him into condition for the most severe struggle. The storms that rage around the buttes of Montana in nowise hindered the structural growth of this ranger of the hills, while these very conflicts gave force and vigor to the inner organs. Spokane grazed on the rich natural grasses of Montana, and in all respects, though properly treated, is the result of an entirely different system and climatic influences from those under which horses are raised in California, or the blue grass regions of Kentucky and Tennessee. The United States offer such a varied climate and such an abundant supply of natural herbage that no breeder of horses need fear failure, provided the stock be of the high-bred classes, should his pasture-land face the Atlantic or the Pacific, or should his horses range over the grassy bench-lands of Montana, or graze on the prairies of Illinois. Many States offer especial facilities for horse-raising, but all are sufficiently well adapted by nature to warrant success to those who enter on the undertaking with judgment and discretion.



THE FAMOUS RACE-HORSE SPOKANE.

Spokane is a son of Hyder Ali, a son of imported Leamington, who, through his sire, Faugh-a-Ballagh, runs back to the Godolphin Arabian. Spokane, as will be seen, is a near kindred in blood to Longfellow, the great son of Leamington, whose long-distance triumphs on the turf were the wonder of the horse-world nearly twenty years ago. Indeed, the blood of Leamington has enriched the veins of many other noted American horses. With such a lineage, and the individual power he has already shown, there is reason to expect still greater things from Spokane. Surely here is a proof beyond dispute that good horses can be bred and successfully raised in almost any region, from the fiery sands of the Sahara to the peat bogs of Ireland, and from thence to our far-off western prairies.

WILL COMMERCIAL FERTILIZERS IMPOVERISH THE LAND.

SOME QUESTIONS ANSWERED BY JOSEPH HARRIS.

Mr. J. H. Tuthill, Long Island, asks: "Is it a settled fact that farming lands can be continuously cropped for an indefinite length of time by using nothing but special fertilizers, and not injure the land? If a farm has been kept in good condition by the use of stable manure, would it be as advisable to rent the farm for five years to a tenant who used nothing but special fertilizers as to a man who used stable manure?"

If, by special fertilizers, we are to understand a fertilizer that contains only one element of plant-food,—say, for instance, phosphoric acid,—the time would very soon come, if the crops are removed from the land, when there would be a deficiency of nitrogen, and the yield of produce would rapidly decrease. In saying this we assume that a farmer would not continue to use a special phosphoric-acid fertilizer unless it increased his crops. If it did not increase the crops there would be no greater quantity of plant-food removed from the soil and, consequently, no loss of plant-food from its use. If it increased the crops, and the greater portion of the crops were consumed on the land or on the farm and the manure returned, the use of such a fertilizer, even though it furnished only one element of plant-food, would rarely impoverish the soil. The plants get food from the subsoil and leave the elements of fertility nearer the surface. On the other hand, if the crops are sold and the use of the phosphoric acid greatly increase the growth, first the nitrogen and then the potash would, sooner or later, fail to be present in sufficient available quantity, and the crops would fall below a profitable yield—even though there might be, and probably would be, a large quantity of unavailable nitrogen and potash in the soil. If the special fertilizer contained phosphoric acid and nitrogen in proper proportions, their continued use, if they increased the crops, would have a tendency to impoverish the soil of potash, though on many clay soils the supply of potash might last for a long time, while on poor sandy soils it would soon be deficient. If the fertilizer contains phosphoric acid, nitrogen, and potash in proper proportions the soil could probably be cropped for many years by their liberal use, though the time might come when magnesia, or soda,

or iron, or some other ingredient of plant-food, would be deficient. As a rule, however, if all plants are furnished with an abundant supply of nitrogen, phosphoric acid, and potash in available condition, large crops can be grown for many years. This is especially true if a judicious rotation is adopted and vegetable matter, such as grass, clover, stubble, sod and roots, are plowed under.

A second point is raised in the following statement and query: "I rented my farm under an agreement that stable manure should be used in part, but last year the tenant used nothing but special fertilizers. If it is a fact that the farm would not run down by the sole use of special fertilizers I would not object, but is it?"

That would depend on the kind of crops grown and what was done with them. I happen to have a farm in just such a condition, except that besides stable manure we have used special fertilizers freely for many years. Large quantities of food, rich in nitrogen, have been fed to animals on a farm for twenty-eight years, and no hay or straw sold. The land is in high condition. If we were going to let the farm for five years for money rent we should decidedly object to the use of special fertilizers, arable cultivation, and the sale of all the crops. On the other hand, if we rented the farm "on shares" we should much prefer to have the tenant use special fertilizers than to farm without them. If the tenant knew his business he would use superphosphate and nitrate of soda freely and grow large crops. At the end of the five years the soil would probably not be in as good condition as now, but the lost plant-food would have been converted into money, of which we should have had our share. The object of arable farming is not to make land permanently rich, but to get good crops and sell them at a profit. If a farmer wishes to enrich his land rather than to get out of it all he can, the cheapest way of doing it will be to keep it largely in pasture. As a rule special manures act quickly, and if the crops are sold do not permanently benefit the land, while stable manure will last for many years. If he applies stable manure this year, and leaves the farm the next year, probably not less than half the value of the manure will be left in the soil, while if he uses nitrate of soda none would be left in the soil. If he uses phosphates and potash and the plants take it all up none would be left. If he uses more than the plants require the excess would remain in the soil.

High-Priced Seeds.—As a rule high-priced seeds are the cheapest, because more care has been taken in selection of stocks to produce them, which incurs additional expense. There are many instances, however, where farmers are paying high prices from the mistaken idea that they are getting a better quality for their purpose. This is particularly true in regard to seed-potatoes, an article which the farmer thinks necessary to "change" occasionally, if not annually, because of the liability of the "stock running out." This is a costly error that no farmer should commit. The facts in the case are, that if the farmer wisely selects from his own stock for seed purposes, it will improve rather than degenerate. Let him first find out what varieties do best with him—and some varieties do far better in a given soil and situation than others. From these seed-potatoes should be selected before any are sold or consumed. Every farmer has noticed that some hills yield more than others; that some vines are stronger, more branching; are short and stocky. From these the best should be saved for seed, and the best are those of medium to large size, of uniform shape, and smooth, and where there are the most in a hill. Follow this practice up, and in a few years there will be a marked improvement in the type. C. L. ALLEN.

FIG. 1. CALIFORNIA GANG PLOW AT WORK.

THE CALIFORNIA WHEAT FARMS.

CHARLES HOWARD SHINN, CAL.

The wheat crop of California bids fair to increase steadily, year after year. Very few persons know how large is the area of excellent wheat land as yet unused, except for pasturage. About 3,700,000 acres are now seeded to wheat annually, but fully 10,000,000 acres in the State are wheat lands. Of the 115,000,000 acres in California, I rate 30,000,000 as fully arable, and to allow 20,000,000 acres for all farm purposes, other than wheat-growing, does not appear unfair. If the yield per acre can be increased by better culture, as our most practical farmers expect, California will each year cut a larger figure among the wheat-growing States.

The broad, rich Californian valleys were considered worthless for wheat in the days of '49. It was the almost universal conviction that wheat would always have to be brought here from other countries. In 1851 and 1852 a little wheat was sown and harvested. The successful wheat crops of the old Spanish missions were remembered. By 1854, the immense profits of wheat were recognized. In 1856 the total crop of the State was 87,000 tons (of 2,000 pounds), grown on 200,000 acres. Ten years later the space seeded had grown to 750,000 acres. It is now 3,700,000 acres.

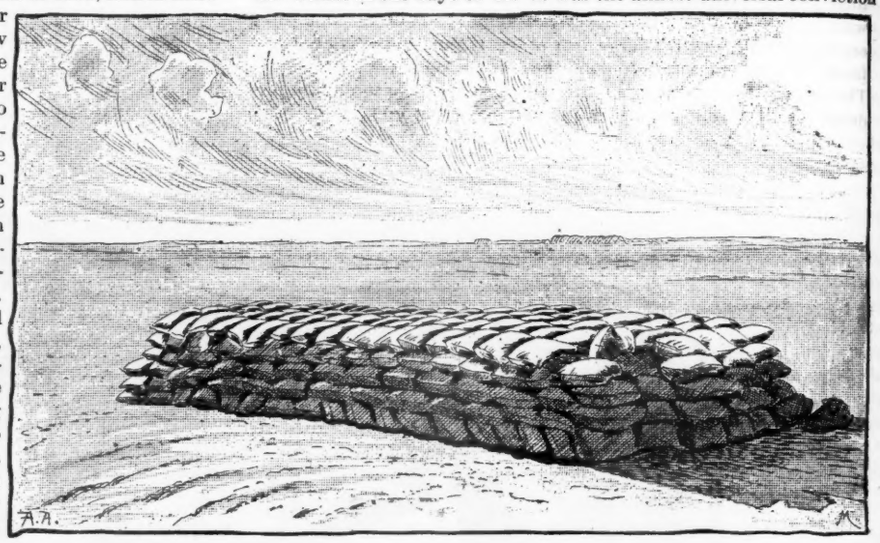


FIG. 2. SACKED WHEAT ON THE FIELD.

We ought to be able to grow half a ton of good marketable wheat on every acre of our wheat lands—but we do not. In 1856, the average crop was 13 per cent below this standard, and the present year it is nearly 40 per cent. Still, the outlook is now favorable to a decided gain in the average, because, while it is the very large wheat farms that reduce the average crop, it is the very small farms that increase the percentage of cost per acre, and both the very large and the very small farms are disappearing. In the rich Californian valleys, such as Santa Clara, there are many wheat districts where the fields range in size from five to fifty acres. Here, the yield is far above the present average, being from twelve to twenty-five centals, instead of six centals, per acre. The soil is rich, the land is clean, the system of cultivation is better than on the great "bonanza wheat farms," and it is only this immense yield that compensates the farmer who pays taxes on much more valuable land. I once saw ten acres of wheat in the Pajaro Valley cut and threshed. The yield was 600 centals, and over fifty prominent farmers were present to see the result. The wheat was worth over one hundred dollars per acre, on the ground, at the prices then ruling. All the "famous yields" of wheat in this valley have been on land rotated about as follows: potatoes one year; corn or beans one year; wheat one year; volunteer wheat used for pasturage one year; then potatoes again, or sugar beets.

The wheat farms of the Upper San Joaquin and of the Sacramento Valley are mainly large, and are cultivated chiefly on the "summer fallow" system, except where winter irrigation has been adopted. It is the droughts which occur almost every year somewhere in the interior of the State which renders wheat-farming so

precarious, and reduces to so low a figure the average of the crop. But, during the past three years, some forty "irrigation districts" have been organized, and the more dry portions of the State will soon be supplied with water for winter use. The tendency is, therefore, to break up the ten- and twenty-thousand-acre farms. Prominent wheat-growers say that the time is coming when "a section" will be considered a good wheat-farm, and on such a farm the expenses of handling can be kept down to the lowest figure, while the average yield will be greatly increased. California ought to produce 5,000,000 short tons of wheat on 10,000,000 acres of hill and valley, and do this nine years out of ten. The problem is always one of cost. The advantages which California possesses are these: the cheapness of wheat-land; the low rate of taxation; the abundant water supply; the great fertility of the soil; the facilities for cheap transportation to the seaboard, and the cheap freights to Europe; the excellent quality of the product, and the inventive ability which has so greatly reduced the expenses of cultivation and harvesting. California is, and will always be, a leading factor in the world's markets for high-class wheat.

The Spaniard often sowed wheat on unplowed ground, and dragged it in with branches of trees. The first American settlers used single plows and home-made triangular harrows. In 1852 and 1853 some wheat was cut with a scythe. As late as 1860 a great deal was bound in sheaves, in the old-fashioned way. But a demand for "improved machinery" was stimulated by the high price of labor. As early as 1859 John M. Horner, of Alameda county, invented and built a "combined harvester," which contained the principles of the great machines of the present time, and ought to have made him a rich man. His machine, which cost over twelve thousand dollars, was destroyed by fire, and no other harvesters were built for many years. The usual method of preparing soil for wheat is with a "gang" of six plows. On light soil, only eight horses or mules are required, but on heavier soils more are attached, until as many as twenty-four horses can be seen breaking up hard adobe for "summer fallow." On large ranches, a dozen "gangs," each with its driver, can be seen moving back and forth across the immense fields. In the most advanced system only five plows are used, but a seed-box and good steel-toothed harrow are attached, so that the plowing, seeding and harrowing are done at one operation. Some soils have to be plowed twice, and harrowed with a heavy eight-horse harrow, before being seeded. But when the whole work can be done at one operation, it costs less than one dollar per acre for labor. Harvesting is done by an improved header and thresher, which cuts, threshes, cleans and sacks the wheat, and drops it in piles of a dozen sacks to be gathered up by a wagon. The machine requires from twenty to forty horses, and from three to eight men, and cannot be run on very hilly land. In many places, therefore, the old-fashioned reapers and standing threshers are still used. But the cost of the latter system is about $3 per acre, while the combined harvester handles the crop for $1.75 per acre. The rainless summers of California make the wheat so dry and hard that no "sweating" is necessary. General Bidwell, one morning, had wheat cut, threshed, sacked, taken to his flour-mill, ground, taken to his house and made into biscuit for breakfast, all within two hours! Without counting the cost of seed-wheat, the machinery in general use here puts in crops and harvests them at a cost of from $2.75 to $5 per acre.

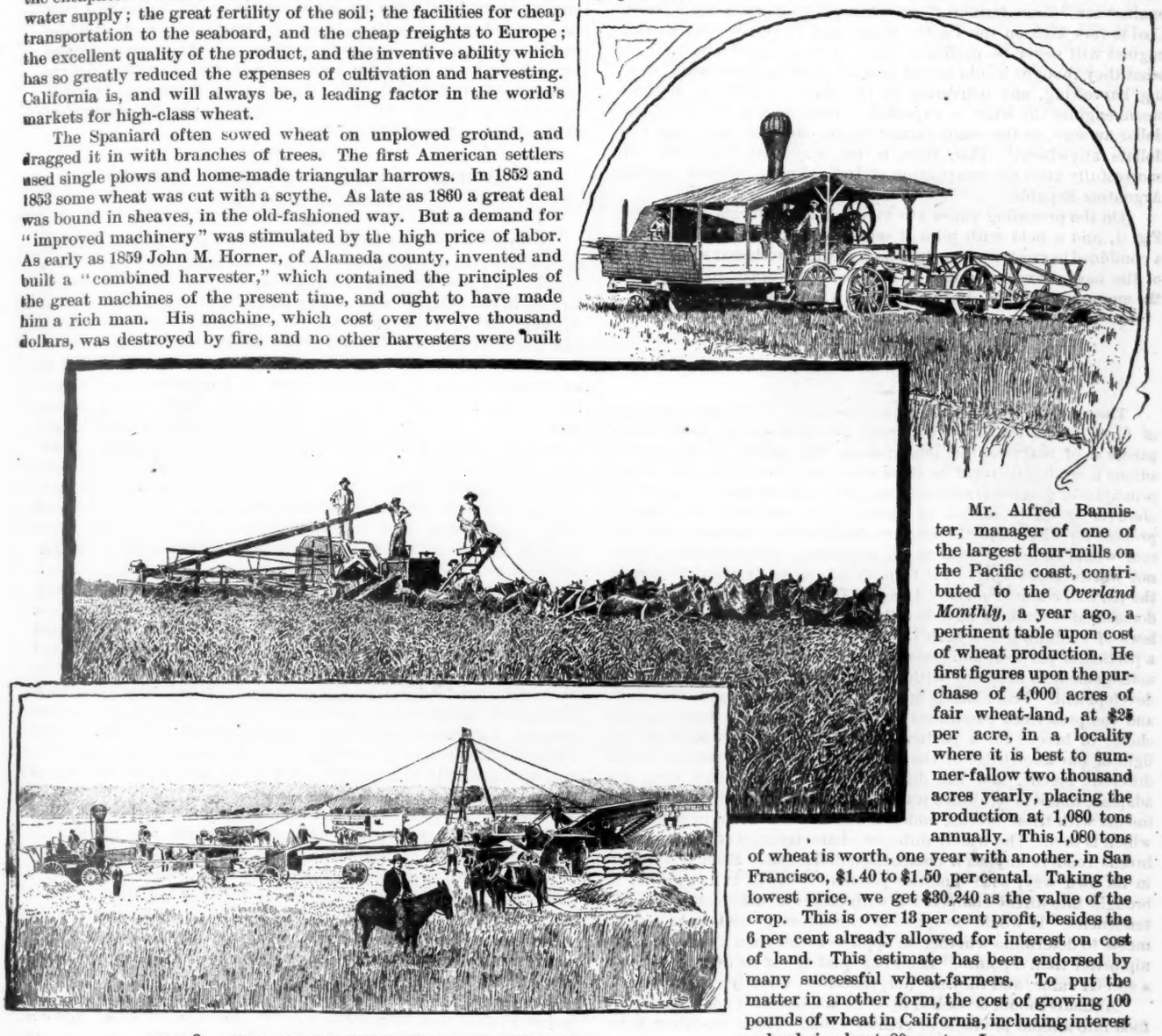


FIG. 3. VIEWS OF THE CALIFORNIA WHEAT HARVEST.

Mr. Alfred Bannister, manager of one of the largest flour-mills on the Pacific coast, contributed to the *Overland Monthly*, a year ago, a pertinent table upon cost of wheat production. He first figures upon the purchase of 4,000 acres of fair wheat-land, at $25 per acre, in a locality where it is best to summer-fallow two thousand acres yearly, placing the production at 1,080 tons annually. This 1,080 tons of wheat is worth, one year with another, in San Francisco, $1.40 to $1.50 per cental. Taking the lowest price, we get $30,240 as the value of the crop. This is over 13 per cent profit, besides the 6 per cent already allowed for interest on cost of land. This estimate has been endorsed by many successful wheat-farmers. To put the matter in another form, the cost of growing 100 pounds of wheat in California, including interest on land, is about 80 cents. In many cases, on large farms, this cost has been reduced to 55 cents; in one case known to the writer, the wheat was grown and delivered at tide-water for 42½ cents per 100 pounds. Mr. Bannister's estimate is as follows:

COST OF CROP.

Interest for one year, at 6 per cent, on cost of 4,000 acres at $25 per acre ($100,000)	$6,000
Taxes, for one year, on 4,000 acres, assessed at $10 per acre ($40,000), at 1.5 per cent	600
Plowing, seeding, and harrowing 2,000 acres, at $1	2,000
$1.50 per cental for seed, 60 pounds per acre, 2,000 acres	1,800
Harvesting by combined machine 2,000 acres, at $1.75	3,500
Wheat sacks at 7c. each, 8 sacks per acre, 2,000 acres	1,120
Hauling and freight of crop to tide-water, and sundries, $2 per ton on 1,080 tons of wheat	2,160
Total cost of 1,080 tons of wheat at tide-water	$17,160

But the last two years have witnessed another development of machinery in California wheat-culture. Steam power has been

successfully applied, and a very great reduction in cost has been made. In the summer of 1889, a large number of field-engines, built here, on California designs, were in the fields with astonishing results. The largest of them cut a swath of forty feet, and harvested the crop at a cost for running expenses of less than 25 cents per acre, as against $1.75 of the old system. The same engine is expected to plow, carrying twelve or twenty or even forty plows, and, since it is a road-engine, it will haul the crop to the nearest station or landing at less expense than if hauled with horses. The price of such an engine, with the harvester and thresher, is from $5,000 to $8,000 at present, but this cost, it is said, will soon be reduced. From the talk among wheat-growers, two or three years will witness the introduction of steam on all the large ranches. The engines are "straw-burners;" or, when plowing, wood can be used. Coal is very high on the Pacific coast, and therefore coal-burning engines will never be profitable here. I have asked wheat-raisers what they thought would be the cost of plowing, harrowing, seeding, harvesting, and delivering at the station would be, if these steam-engines do what is expected. They answer: "About one dollar an acre, on the easily-farmed lands, and not more than two dollars anywhere." This, then, is the way that California can successfully meet the competition of India, Russia, Siberia, and the Argentine Republic.

[On the preceding pages are views of a California gang-plow, Fig. 1, and a field with piles of sacked wheat, Fig. 2. Below it is a combined harvester and a stationary steam-thresher at work. One of the new steam-harvesters is shown at the upper right-hand of the engraving, Fig. 3. In the middle is a horse-harvester.]

BREED OR FEED?

DR. MANLY MILES, MICHIGAN.

The question in our heading may be taken as the type of a class of farm topics too often seriously discussed in the agricultural papers as of real practical importance. The fallacy of such propositions is readily detected by those who have correct notions of the principles of practical farm economy, while the careless or superficial observer is easily misled by them. The engineer who should propose for discussion the relative merits of the steam-engine and coal would be looked upon as an ignoramus, whose opinions were not worth considering. Yet farmers are seriously asked to discuss the parallel conundrum of "breed or feed." The various breeds of domesticated animals have had their origin in accordance with the laws of evolution, and each has peculiar qualities that adapt it to a particular purpose, and these can only be retained by a system of management in harmony with the conditions that have led to their development. From this it must be seen that the purpose in view and the prescribed conditions of management must determine the choice of breeds for a particular farm. It is also evident, in the light of our knowledge of the distinguishing characteristics of the different breeds, and the different purposes to which they are adapted, that it is an absurd waste of time and money to make experiments with these breeds, under the same conditions, to determine which is best. The widely-different characteristics of the improved breeds renders any such comparison fallacious. Each is valuable in its own way, with qualities peculiar to itself, and it cannot be brought into direct competition with others of different habits and tendencies. It would be quite as consistent to undertake experiments to determine whether an apple is better than a pear, or a turnip better than a potato. Each has qualities of its own that give it a special value, and they are not, therefore, directly comparable.

Animals should be looked upon as machines for converting their food into animal products of greater value. These machines have, fortunately, been developed in great variety, so that, by judicious selection, various kinds of raw material, in the form of food, may be economically converted into a variety of useful products. The farm, then, is, in effect, a factory, fitted with proper machinery for manufacturing special animal products from the produce of the fields, and it is well for the farmer that the machinery at his command is not all of one pattern, and fitted for a single purpose.

As in other manufactures, the best results can only be obtained by a suitable adaptation of the machinery to the work required of it, so that the food may be utilized with the least waste and the largest return in the desired product secured. It will not pay to put machinery, especially adapted to work cotton, into a woolen factory, or attempt to make carpets in a factory fitted for making light cotton goods. The great advance in manufactures of all kinds has been brought about by the intelligent adjustment of machinery to the special work required, to economize labor, avoid all possible wastes, and secure the greatest returns for the raw material worked up, while the profits are the aggregate of many small items, each of which in itself is inconsiderable.

The farmer should exercise the same intelligent skill in the harmonious adjustment of the several factors of production he has to deal with, so that each may supplement the others, and the aggregate of small items may be made to appear as substantial contributions to the margin of profits.

In order to realize the advantages of this thorough system, the breed must be adapted to the requirements of the farm for the special purpose in view, and the system of feeding and management must be planned to contribute its full share to the desired results by conforming to the habits and inherited tendencies of the animal that has been selected, in order to secure the largest net returns for the capital invested. This can only be done by a strict conformity to the biological and economic laws on which the principles of farm management are founded. Investigations and discussions in which these laws are ignored will not tend to promote the development of an improved system of agriculture.

"ARTIFICIAL" VERSUS "NATURAL" CHICKENS.

E. K. WINANS, NEW JERSEY.

A writer who is an authority on poultry matters asks poultry-raisers how chickens, hatched in an incubator, and raised in a brooder, can possibly differ from hen-reared ones. There is no difference in the plumage and "fancy points" of natural and artificial chickens, but as a general thing brooder-raised fowls are smaller and less stalwart than their kinsfolk from the old-fashioned coops. When the conditions are perfect, when the chickens are hatched in an incubator with an interior uniform of temperature and plentiful of humidity, and kept quietly, in the dark, until they are strong on their legs; when they learn at once the way to their brooder, and never get chilled; when they have exercised enough while feathering; they may grow into fine breeding stock,—ideal cockerels and pullets. Such up-bringing is a successful imitation of a good hen, who comforts the wretched wet chickling in her downy breast until it is dry and strong, and who calls it to her when it first complains of cold, and sternly orders it home if it wanders too far in its first, feeble days.

But, unfortunately, the other side of the story is more frequently true. As a matter of fact, there are twenty different temperatures inside of most incubators. Especially is this so of those warped and shrunken from several years' use. The germs in the eggs, exposed to those varying temperatures, are weakened and deformed. While the chicks are "drying off," after being hatched, they often complain from the cold more than they would if under a hen, and no wonder, for they go crawling restlessly about over each other's sticky bodies, instead of nestling in soft feathers. Some machines, too, have absurdly light nurseries, where the baby chicks run up and down begging for food before they are thoroughly dry. The brooders they are afterwards moved into may be good in their way, but have not the power to call their wandering children home, and the amazing stupidity of some little chickens will cause them to stand screaming with bewilderment and cold when there is a shelter a foot away from them, heated to ninety-five degrees. The brooders are, however, often not at all good in their way. Not to mention the great errors of overcrowding and dirt, they are often so hot as to cause faintness in the chicks, and to stunt the growth of those they do not kill.

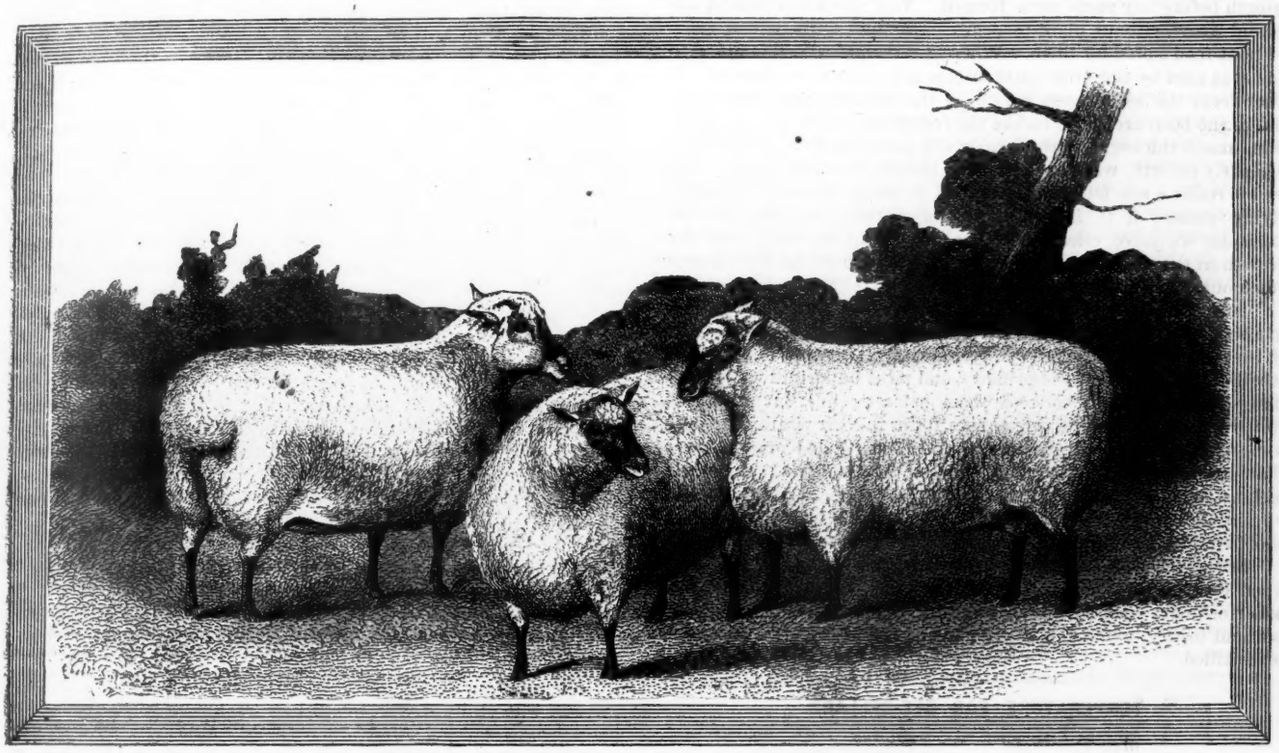
Incubators are indispensable now. The vast majority of hens refuse to sit in time to supply a most remunerative demand, and our brooder-houses make us independent of Dame Partlet as far as the market is concerned; but unless we rely on her for breeding stock our poultry may sadly deteriorate.

Sheep Sales in England.—The sales of well-bred sheep in England during the past season were mostly marked by sharp competition and good prices. In one sale of Shropshires at Shrewsbury over 2,000 sheep from various flocks were sold. Prices for ram lambs ranged from five to eighteen guineas ($26.25 to $94.50) each. At a sale in Birmingham an equal number was sold, one aged ram selling for two hundred guineas ($1,050), and another for one hundred and seventy guineas ($896.50). A sale of Dorset horned sheep is reported, at which one ram sold for eight guineas ($42), and lambs from sixty-five to ninety-two shillings, or $26 to $36.80. At a sale of Hampshire Downs, 5,000 animals were sold, mostly wethers.

SOUTHDOWN SHEEP IN AMERICA.

The revival in the sheep interest throughout the country has caused greater importations of the well-known breeds, and also the introduction of several which have hitherto been nearly or quite unknown on our shores. But amid all this, the Southdowns have fully held their own. The popularity of other mutton breeds has not created any injurious rivalry, and the Southdowns never stood higher among intelligent breeders than they stand now. They are comely sheep, with small, neat heads, thin, sensitive ears, brownish-gray faces, broad, level backs, plump bodies, deep quarters, and light, clean legs of the same color as the face. Full-grown ewes and wethers, in good condition, average in weight from 150 to 200 pounds. The fleece is dry and the staple of middling length, somewhat harsh, but strong and durable. The fleeces average from five to eight pounds of washed wool. It is the quality of their flesh which gives the Southdowns their pre-eminence. The mutton is delicate and juicy, with the lean nicely marbled with fat, and unsurpassed in flavor. The ewes are prolific, good mothers, and good nurses. The breed is prepotent, impressing its characteristics on all others with which it is crossed. The Southdowns must be kept in small flocks, and well cared for. They are not adapted to "rustling" in large flocks, like Merinos, but are well-fitted for the farmer who works a moderate area and will care for them. The American Southdown Association, which numbers in its membership not only leading breeders, but also gentlemen who are eminent in public life, is in a very flourishing condition, financially and otherwise. Two volumes of its "Record" have been issued, and the work on the third is well advanced. The price of these volumes has been reduced to $2.50 each for members of the Association. The entry fees are as follows: For American-bred animals, or animals imported previous to April 1, 1889, owned by members, $1 each; owned by non-members, $2 each; animals imported from Great Britain since April 1st, 1889, $5 each. The officers of the Association are: President, J. H. Potts, Jacksonville, Ill.; secretary, S. E. Prather, Springfield, Ill.; treasurer, DeWitt Smith, Bates, Ill.; directors, C. M. Clay, Kentucky; Hon. Levi P. Morton, New York; John Jackson, Canada. The Southdown interest is certainly in good hands, and the purity and high standard of the breed will be fully maintained.

American breeders and feeders of Southdowns pursue a system somewhat different from that in England. As with other classes of stock, early maturity is regarded here as a strong point. Instead of keeping a Southdown wether until it is three or four years old, with a view of producing the heaviest and ripest carcass possible, the American method is to feed high from the first, and produce first-class mutton at two years old or less. The question of profit depends largely upon early maturity. At the prices of meats and wool in this country, a one or two years' extra feeding is likely to make all the difference between profit and loss.



GROUP OF PURE-BRED SOUTHDOWNS.

THE NATURE AND PRESERVATION OF SEEDS.

DR. GEORGE THURBER.

The question as to whether farmers may or may not raise their own seeds with advantage has often been discussed. The general opinion is that, seed-raising being a distinct business, and that its success depends upon so many things which the average farmer is not supposed to know, that it will be cheaper in the long run for him to purchase his seeds of those who make a business of raising them. There are differences in farmers, and there are those who will observe the conditions necessary to produce perfect seeds. But there is one thing about seeds in which every farmer is more or less interested:

THE KEEPING OF SEEDS.—However closely he may calculate, the farmer will find himself, at the beginning of winter, with more or less seeds on hand. If these are properly cared for during the winter, they will be just as good as any that may be bought. It is, therefore, important to know how to preserve them.

WHAT IS A SEED?—It is, apparently, a dry and lifeless body, which, under certain conditions, will undergo certain changes, and produce a plant—a change so wonderful that, were it not so common, we should look upon it as stranger than any mystery that the most skilled conjuror can show. But we have suggested that, for the seed to produce a plant, it must be submitted to certain conditions. It will be inferred that, in order to preserve the seed in good condition throughout the winter, it must be kept from such influences. We plant a seed in the earth, and, in due time, a delicate, green, living, and growing plant appears. Where did that plant come from? Perhaps some, who have never thought of the matter, may be surprised to be told that the plant came out of the seed. Every sound seed contains within it a minute plant. In some seeds the plant is more rudimentary than in others, but still to be made out if you examine it with a magnifying-glass. This is called the embryo. It is very large and plain in the bean, and fills up the whole skin of the bean. So with the pumpkin: the embryo is still more plainly a plant. You know that if you set out a cutting from a stem of a geranium or a currant-bush, in time roots will be

formed, and growth of stems will take place from the buds. If you cut up a potato so that each "eye" or bud will have a small piece of the potato with it, and plant these pieces, in time roots will be formed, and the eye grow to form a stem. The seed, then, is not much unlike the cutting of the geranium and of the currant, or a "set" of the potato. In the seeds mentioned—the bean and pumpkin—the plant, when it appears above ground, has a little stem; at the top of this stem are two leaves, different in appearance from the succeeding leaves of the plant, and called "seed-leaves." Very soon there are produced, from the lower end of the little stem that bears two leaves at its top, a number of small roots. When the plant has these it is complete, and has all that it needs with which to grow. It has roots to hold it in place in the soil, and to take up moisture and food from it. It has a stem to hold up the leaves, and leaves to make use of the liquid taken up by the roots. Between the seed-leaves are other leaves, folded up and forming a small bud, called a *Plumule*. The next growth that you will notice will be from the plumule. The leaf, or leaves, of this will unfold and enlarge, and, at the same time, another bit of stem will grow, and lift up more leaves, and the plant will grow on, producing roots, stems, and leaves. You will have noticed that the little plant made some growth before any roots were formed. You also know that plants cannot grow without plant-food any more than animals can grow without food suited for them. Where did the plant-food come from that was used by the little plant before it had roots to feed it? It came from the seed-leaves, which, in the pumpkin are somewhat, and in the bean are very, unlike the following leaves of the plant, being much thicker, and the bean much gorged with food to supply this early growth, which takes place before roots are ready. The seed is really a special organ provided as one of the ways of multiplying plants; it is, indeed, a sort of cutting, provided, in the examples we have cited, the bean and pumpkin, with food for growth in the seed-leaves, but in many other plants the food is provided outside of this plant embryo.

THE FIRST STEP IN GERMINATION.—The first thing that happens to a seed after it is sown is for it to take up moisture from the soil. If the seed be not supplied with moisture no change takes place. It will be inferred that the primary and most important step, other things being equal, is to keep them perfectly dry. It should be stated that seeds, being living things, differ in their vitality. While some—such as the parsnip—are not to be depended upon if more than one year old, the majority will last two and three years, and melons, squashes, and all of that family, are thought to retain their vitality indefinitely. Of course, if a seed is by nature endowed with short vitality, no amount of care in keeping will prolong its duration.

SEEDS.—The moisture of the atmosphere has much influence upon the temperature that seeds will bear. Wheat, barley, and other ordinary seed we found to admit a dry temperature of 167° without injury, while at the same temperature, in vapor, the seeds were killed.

TEMPERATURE FOR BEE-CELLARS.

W. Z. HUTCHINSON, MICHIGAN.

The proper temperature for bee-cellars and other winter repositories for bees is quite generally admitted to be about forty-five degrees. There, are however, a few points in connection with temperature that need consideration. The size of the colonies, the protection afforded by the hives, the humidity of the atmosphere, and the season of the year, must all be considered in connection with temperature. A colony weak in numbers needs more warmth than does a populous colony. The light colonies ought to be placed near the top of the cellar, as the temperature is several degrees higher there than at the bottom. Many bee-keepers now practice removing the bottoms to the hives when putting them in the cellar. This secures better ventilation and allows all dead bees and rubbish to drop down away from the clusters; but this removal of the bottom of the hive allows the heat to escape more readily. With open-bottomed hives, the temperature ought, perhaps, to be five degrees higher than otherwise. If the hives are closed, except the entrances, and then surrounded with chaff-cushions, or some kind of packing, the temperature might be allowed to go lower. The warmer the air the greater is its power of absorbing moisture; and, the dryer the air in a cellar, the lower the temperature may be allowed to go. Charcoal or unslaked lime kept in a cellar will absorb the moisture. At the approach of winter the bees cluster closer together, and enter into a condition very nearly resembling hibernation. When in this state a temperature a little above freezing, say about 40°, is the best. The longer and more profound is this winter slumber, the better do the bees winter. As spring approaches they arouse to greater activity, breeding begins, and a higher temperature is needed. If the cellar is well filled with hives of bees, the increased activity on their part tends of itself to raise the temperature. An examination of the bees themselves will probably show as clearly as anything whether all is as it should be. If they are closely clustered and quiet, the temperature is right. At no time should it be allowed to reach the freezing point.

PROVIDE FOR THE FRESH COWS.

GEORGE E. NEWELL, NEW YORK.

The wise dairyman will make provision in advance for exigencies that arise in the care and management of stock. He can employ a few spare hours to no better advantage than in preparing a few stalls for cows during parturition. The too-common custom of leaving cows stanchioned up to the moment of calving, and often so confined through its throes, is as inhuman as it is unwise. The females of all animals instinctively seek seclusion during these trying periods, and that seclusion, with care and comfort, should be freely given them. Unless the dairy is a very large one, it will not require more than two or three stalls for the purpose indicated. There is generally spare room enough for these in the average stable, but if not, erect them elsewhere in warm quarters. Build an ordinary box-stall, with bars opening on the stable. The dimensions of the stall need be only sufficient for the free movements of the animal. Make the stalls snug and warm; keep them dry, and well littered with straw. The cow should be turned loose in the stall a few days prior to parturition, and kept there till after the expulsion of the placenta. Isolation for a longer period would be still better. Consult the farm record, or memorandum book, to see when the natural period of gestation will expire, and keep careful watch of the cow. She may calve before or after her time; her symptoms and appearance must govern in this regard. New milch cows, in the severest weather of our harsh Northern winters, can be made even more profitable than in mid-summer. They require warm quarters and abundant food. In the early spring, when the greater number of dairy cows are coming in, stalls are indispensable, not only for the comfort of cows, but to insure their safe passage through this trying ordeal. In these matters, the best that man can do is to assist nature. Cows that run down at calving time, and are ill cared for and neglected, will be profitless to their owners the rest of the season.

FEEDING PIGS ON BANANAS AND GUAVAS.

Sidney Moxsy, Jamaica, W. I., writes us: "I give my pigs boiled bananas (green), with corn-flour sweepings, or damaged flour mixed with cold water and salt, and then boiled. Pigs from six to eighteen months old are fed about a gallon each, morning and evening; younger pigs a smaller quantity. They also get ripe bananas, guavas, sugar-cane, and ripe, wild fruits, in season, with plenty of pure water. Does this kind of feeding promote or retard their development? Are they sufficiently nutritious with grass?"

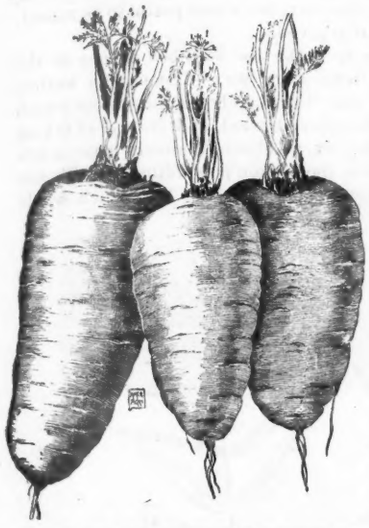
All of these foods are only fitted to fatten grown hogs, or those with a developed body, muscle, and bone. Such hogs should not be fed all they will eat for a considerable time, or they will become feverish and not do well. The running out to grass, with plenty of it to eat, would help to balance the sugar and starch contained in the other foods. The proper thing to do, in order to promote the health and vigor of these pigs while young, and during the growing period, is to feed wheat-bran and middlings. The bran is more nitrogenous—muscle-forming—than the middlings, and is just the thing to build up the bodily structure in that in which other foods are wanting. These native foods are very fattening. The bran has the muscle and bone material in it, and the elements for bowel distension. The fruits should be kept until the sugar is the most fully developed, *i. e.*, in a ripe state. The bran should be made into a slop, and the middlings also. Linseed meal, made by the new process, is also a most excellent food to go with starchy and sugary foods. It is best to mix it with bran (ratio, one part of linseed meal to three parts by weight of bran). A shelter should be provided for the hogs to go under when the sun is hot, and with these provisions there is no reason why pigs may not be successfully raised and also excellent pork made. It is most important that the sows should have plenty of bran while bearing their young in order to develop strong and mature offspring. From one to four quarts a day of the bran or the mixture is enough for a day's ration divided into two equal feeds.

THE HALF-LONG, STUMP-ROOTED CARROT.

C. L. ALLEN, LONG ISLAND, N. Y.

There is much less attention paid to the choice of varieties of carrots for a given soil than the importance demands. For field-culture, the long orange was the variety in general use until within the past few years, since when, several new types have been introduced, the tendency being for shorter roots, both on account of a saving of labor in digging, and in greater productiveness. For most localities, particularly where the soil is light and thin, the stump-rooted varieties are preferable.

Last spring I moved to a place, the soil of which is naturally poor and has been drawn upon for all its worth—and more—by truck farmers. In addition to that depletion, the sand from the cellar had been distributed over it to the depth of an inch or more. In such a soil the garden seeds had to be sown, and this could not be accomplished before the 15th of May. The soil was so very poor that I soon saw it would not pay to work it well. The consequence was, everything planted was neglected, the beets, carrots and other roots were not thinned out, and I had no better garden than the average farmer, which is poor enough. The only vegetable that defied neglect was the half-long, stump-rooted carrot, and the roots are as beautiful, well-shaped, and of as good quality as I have ever seen. The yield, by actual measurement, was at the rate of 520 bushels per acre, which is more than double the quantity that could have been raised had the long-rooted varieties been chosen, and not nearly the amount I would have had if the soil had been in good condition, and with good cultivation. Heavier crops can be produced in deep, rich soils with the long-rooted varieties, but in thin soils the shorter kinds give by far the greater yield.



BUNCH OF HALF-LONG STUMP-ROOTED CARROTS. (*One-half actual size.*)

[Our illustration shows average specimens of half-long, stump-rooted carrots, drawn from nature, and reduced to one-half their natural size.]

WORKING FOR A PURPOSE.

DR. MANLY MILES, MICHIGAN.

With the increase of accurate knowledge relating to rural pursuits, it becomes more and more evident that there are not only clearly defined laws of plant and animal growth and development, but that, in the economies of farm management, there are well-established principles of practice that cannot be set aside or superseded by any special considerations of detached facts. To obtain the highest success in farm practice, these well-defined principles must be recognized, and the system of management must be in harmony with the natural laws that are the dominant factors in determining the results obtained.

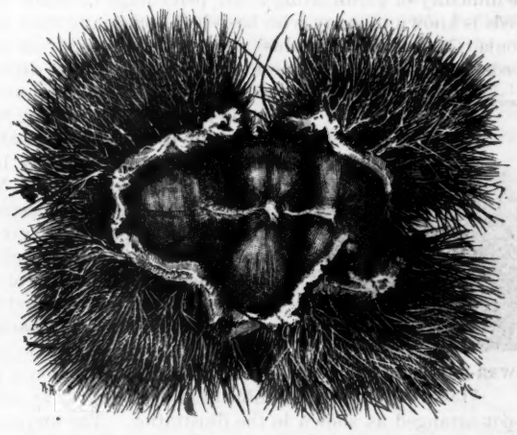
In a recent article on the organization of the agricultural experiment stations, it is said that "the future usefulness of these stations will depend upon what they may discover of permanent value, and this must come largely from the most abstract and profound research. In the long-run, those stations will do best that plan their work philosophically, and the prosperity of the enterprise, as a whole, will be proportioned to its success in the discovering of the laws that underlie the right practice of agriculture." The truth of this statement should be impressed on every farmer, and particularly on those who control and direct the work of the stations. The so-called practical experiments, conducted as they are in a haphazard sort of way, may attract attention for a time, and serve to bring the individuals who conduct them into transient notice; but they will, in the end, prove to be worse than useless, as they cannot be correlated with any known laws from lack of attention to essential data, and, if repeated on the adjoining farms, the results obtained would, in all probability, be reversed, or at least materially modified.

A consistent system of agriculture must be planned to make the most of all factors concerned in production, and care must be taken to avoid those methods that are in conflict with the well-known laws of growth and development of both plants and animals, and the established principles of farm economy. Superficial, imperfect views, that are hastily formed from a limited array of facts, are misleading, and especially when they relate to theories that have been made to explain the results of experiments that involve but a small portion of the factors concerned in the subject under investigation. They are "like the twilight which, holding of day on the one hand, and of night on the other, mocks the senses with distorted appearances which thicker darkness would hide, but which a broader daylight would dispel." The futility of the discussion of obscure notions that arise from an examination of a few facts, that have not been correlated with the essential factors of the problems under consideration, must be obvious. The general recognition of the fact that the principles on which a correct practice is based are interdependent, and a representation of natural laws will prevent the discussion of assumed antagonisms in their applications.

AN IMPROVED CHESTNUT,—THE PARAGON.

To those not familiar with the recent improved varieties of chestnuts, an increase in size suggests a proportionate deterioration in quality. While this may be true with the Japanese class, it does not apply to some of our American seedlings, prominent among which is the Paragon. Our illustration, drawn after a burr received last fall from H. M. Engle & Son, of Pennsylvania, gives an accurate representation of this variety. The spines on the burrs are very long, and the nuts double the size of our native chestnuts, while their quality is fully equal to them. Although the origin of the Paragon is not definitely known, all its characteristics indicate that it is either an American seedling from a European variety, or a cross between a foreign and an American variety. The tree is an early and a prolific bearer, and has proved perfectly hardy in the vicinity of New York. We have no knowledge of any bearing trees outside of the grounds of the introducers, but the Paragon has so much to recommend it that, when it once becomes more widely distributed, we have no doubt of its becoming the parent of a new strain of chestnuts superior to any now in cultivation.

Roots in Winter.—As winter approaches, trees make preparation by laying in a store of starch and other food materials, mainly in the twigs and roots, near where it will be wanted for use the following spring. Most kinds then shed their leaves, and some of them a part of their twigs. The roots make special preparation for winter. As they are now of little immediate use to the plant, the root hairs and most of the fibers die, leaving only the stronger root-



PARAGON CHESTNUT BURR. (*One-half natural size.*)

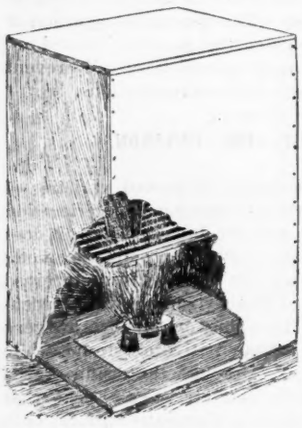
lets in the best feeding-ground, to resume growth next season. The rootlets near the surface are killed most, thus favoring the development of those which lie deeper, where they are safe from drought and future freezes. In grasses, the older roots die entirely, leaving the support of the plant to the younger roots and those which are produced in the spring. In those grasses which have creeping root-stocks the roots probably never live to be much over a year old, the

only living roots found before new growth begins in the spring being such as were produced late the previous year. In those grasses which grow in bunches and have less opportunity to form new roots, the roots often live for several years. This probably explains why such grasses are, as a rule, deeper rooted and better able to withstand drought than those of a creeping habit. Creeping grasses have also in their rootstocks a good place for the storage of starch, from which new roots can be quickly formed, so that it is not so necessary to maintain life in a large number of roots during winter.

PROF. A. A. CROZIER, Iowa.

AN EFFECTIVE FUMIGATING-BOX.

Very few window-plants are entirely free from that troublesome insect, the green aphis, and the problem of getting rid of it is not always an easy one, on account of want of a place in which to fumigate with tobacco. Our illustration shows a convenient box in which may be placed plants infested with green lice while a smudge of tobacco is being given. There is a piece of zinc in the bottom of the box, to prevent its taking fire from any dropping coals. On this set three flower-pots, and on these the pan containing the leaves. The pan should have a hole in it the size of an egg, to give sufficient draught that the leaves will be all consumed. In starting the smudge, place a few shavings first, then the tobacco leaves, slightly moistened. Those leaves termed "sand leaves" by the growers are best, but stems may be used, and are much cheaper. The shelf over the smudge-pan should be full of holes, or made of lath, in order that the fumes may rise. A large dry-goods box will answer the same purpose if it is not desirable to be at the expense of a specially-made box, but it should be quite tight, in order to retain the smoke.



FUMIGATING BOX.

Many plants will not bear a very strong fumigating, an example being the heliotropes and cinerarias; but if these be sprinkled before fumigating, it will decrease the danger of their being injured by the smudge. After a trial one will readily learn about what quantity each plant will stand.

HOW TO MANAGE FINE SEEDS.

WILBUR F. LAKE.

The difficulty of germinating a fair percentage of many of the finer seeds is known to many who have had occasion to start plants of Begonia, Calceolaria, Mimulus, and even tobacco, from seeds. Such seeds, covered with the finest sifted soil, often have difficulty in penetrating it by the time they are in a condition to spring forth, especially if watered from above, though the covering may be as thin as it is possible to give. Many such seeds are specially sensitive in their earlier periods of growth, and ofttimes will fail if neglected in the matter of moisture for even an hour. From my very first venture with three fifty-cent packages of Begonia, Primrose, and Cineraria seeds, I have overcome these difficulties very largely by using a flower-pot arranged as shown in the illustration. The preparation is as follows, using an eight-inch pot: The first three inches consist of broken pots or potsherds, the next two inches of coarse soil, the coarsest being next the potsherds, gradually making it finer near the top, and the next inch of the finest sifted soil, the finer the better (I sift it through a flour-sifter). This leaves about two inches from the top of the soil to the top of the pot, which is to be covered with a pane of glass. The finest seeds will receive no harm with this treatment if not covered at all, providing the pot is kept in the dark until some roots have been formed. For bottom heat, we may place the pot on the back of a stove, or a small lamp may be kept burning under it all the time by a little ingenuity in arranging it. The water is supplied in a peculiar way, the pot being set in a basin of hot water containing an amount which will bring it above the layer of broken crock when the pot is placed in the basin. After a thorough wetting has been absorbed in this way, the pane of glass will hold the moisture for a considerable time. In some cases of quickly-germinating things, it will not be necessary to give another supply of water until the growth has appeared. Air should be admitted frequently—at least once a day—until the seedlings have appeared, when a small piece of wood should be laid across the pot under the glass so that fresh air will be continually coming in. This will prevent, to a large extent, the danger of dampening off, which causes, sometimes in a day, the whole potful to be ruined, if an insufficient supply of air is given.

FLOWER-POT PREPARED FOR FINE SEEDS.

Another pleasing way is to make the seed-bed in one of the deeper cigar-boxes, planned in the same way—first having washed off all the paper which is inside. I start in boxes some seeds which are somewhat larger than the above-named, and, instead of taking the trouble of preparing the box as above, I simply make a few holes in the bottom and put in the broken pots, filling up with fine soil, and put a piece of porous paper over the top, which would allow water to soak through, and pour the water directly on the paper. The point of keeping such seed-boxes away from the light, and in a warm place to induce prompt germination, is an important one. When left where the sun's rays come directly on the seeds, they are often dried so much before one notices, that the germs which may have just started are destroyed. A shelf back of the kitchen stove is often the best place to be had until the seedlings are a quarter of an inch high, but of course they should not long remain without strong light after sprouting, as they become drawn, and seldom make good specimens afterward.

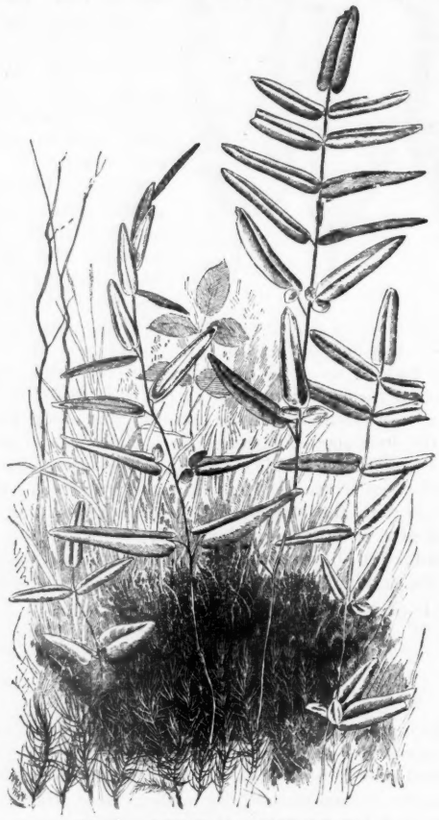


FIG. 1. PELLÆA ATROPURPUREA.

As soon as the seedlings can be handled, they should be pricked out into similar boxes or pots, and for most greenhouse kinds should retain the glass over them for a month or so—at least all the time they remain in the pot or box in which they are pricked. After they have reached this stage, the glass should be raised up at both ends by using two pieces of wood on which it is laid, instead of only at one end. This arrangement will also be found useful in rooting some of the difficult subjects, especially evergreen plants, like *Olea fragrans*, Laurestinus, and Azaleas.

FERN CULTURE.

G. A. WOOLSON, VERMONT.

Much more attention might well be given to the cultivation and naturalization of hardy ferns on lawns and in shady garden nooks. Flowerless though they are, their delicate beauty and great variety of form and texture render them attractive, as well as an interesting study, and far more pleasing to the eye than consumptive-looking flowers—the inevitable result of too much shade. As a rule,

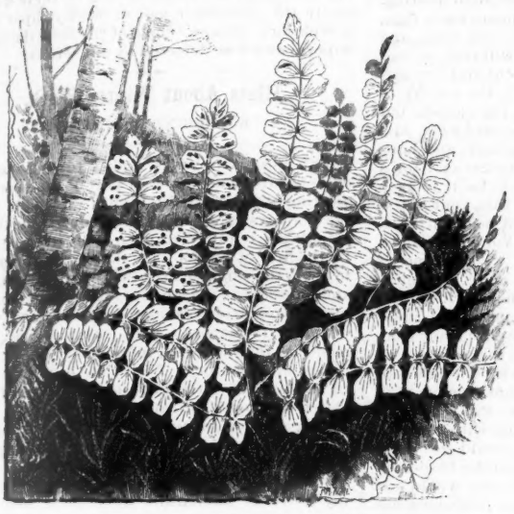


FIG. 2. ASPLENIUM TRICHOMANES.

ferns need shade; they also prefer a well-drained spot, and are most at home in a soil composed largely of leaf-mold, but easily adapt themselves to other circumstances.

For tall-growing ferns, so effective around the base of verandas, the Ostrich Fern (*Struthiopteris*) is much in favor. Its long plume-like fronds are quite tropical in appearance. The Virginian Grape Fern (*Botrychium Virginicum*) is desirable. None, however, excel *Osmunda regalis*, or Royal Fern. After wrenching this beauty from its native soil you will realize that a prize has indeed been gained; not only on account of its beauty, but of the tenacity of its rootlets; it requires masculine strength and a strong trowel or spade to accomplish the feat; but once up it takes kindly to cultivation.

Ferns are particularly useful for rock-work. No special care need be observed in the building of such structures, except that there be an abundance of pockets or crevices of different sizes, filled, if possible, with leaf-mold. It is important, however, that each should have a soil-connection with the earth beneath.

The various Wood-Ferns (*Aspidiums*) and the *Polypodiums* are excellent for this purpose. The Maiden-Hair (*Adiantum pedatum*)

FIG. 3. ASPLENIUM RUTA-MURARIA.

grows nicely anywhere, and is an old-time favorite. Do not forget to add to your collection *Onoclea sensibilis*, the Sensitive Fern. Another much more graceful fern is *Cystopteris bulbifera*, or Bladder Fern, found in shady ravines; the fronds grow in tufts, are very long and slender, and are exceedingly delicate in texture; nevertheless, it will grow well on the north side of rock-work; the curious bulblets on the under side of the rachis and pinnæ, falling off, multiply rapidly.

Only real fern-lovers can understand the feeling of exultation upon discovering for themselves rare specimens of the great family of Filices. If you are so fortunate as to find the *Pellæas*, or Cliff Brakes, *P. atropurpurea* will make a fine addition when planted in the crevices of calcareous rocks; its blueish-green pinnæ form a pleasing contrast with other ferns. It is depicted in Fig. 1. But if *P. gracilis*, the most delicate of all the brakes, meets your delighted eyes, don't stand hopelessly before it because its slender root-stock is so hidden in the seams of some great rock; true, it is "rarely secured by collectors." The only sure way of preserving this fern is to press it at once. The Spleenworts (*Asplenium*) offer several little treasures; among them *A. trichomanes*, or Maiden-Hair Spleenwort, is a dainty little fern growing in tufts—or rootlets, one might call them—on the shady side of damp cliffs. The thread-like stipe is "purple-brown and shining," contrasting prettily with the vivid green of the tiny rows of pinnæ on either side. It is shown in Fig. 2. Another fine member of the same family is *A. ruta-muraria*, shown in Fig. 3. Although very scarce, there is no mistaking it, for there is nothing else which looks like it in the Fern Family; in fact, its relationship might be doubted, were it not for the *sori*, or fruit-dots, on the under side.

Both varieties contrast strangely with the tall, soldier-like fronds of *A. ebeneum*, but all three are cultivable. The Spleenworts are often found in connection with the Walking-Leaf (*Camptosorus rhyzophyllus*), Fig. 4. This also can be cultivated, if taken up with great care and given similar surroundings; it will fasten the apex of the long, tapering leaf in a bit of soil, and grow another plant; a fashion by no means common among ferns. For in-door ferneries, evergreen kinds are preferable. For home decoration, through the summer and fall, ferns are invaluable. A vase or flower-pot, filled with a variety of growing ferns, gives a delightful forest odor, sug-

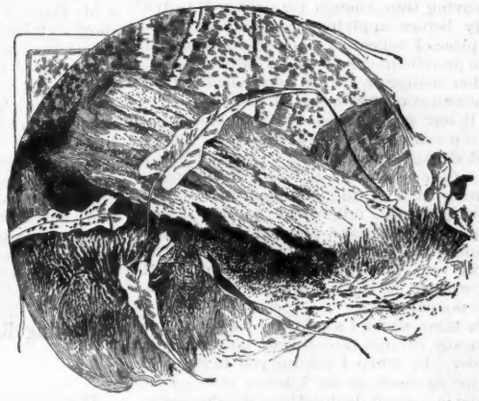


FIG. 4. CAMPTOSORUS RHYZOPHYLLUS.

gestive of purling brooks with ferny banks, without the drawback—if truth must be told—of troublesome mosquitoes with officious bills. Such a fernery gives little trouble and is "a thing of beauty and a joy"—for many days, at least, as the same clump will last for years if carefully set out-of-doors in some sheltered spot for the winter, and taken into the house again for the summer. If an anemone, hepatica, or trillium nestle among the roots, so much the better. Ferns may be gathered any time, for in-door or out-of-door culture, as plants in different stages of growth are always to be found.

The Cellar and the Window.—It seems almost impossible to have a successful window garden, unless one has a good cellar as an adjunct. When we say a "good cellar," it should by all means be dry; light enough to allow one to work comfortably, and should vary little from 40°. The first and chief use of the cellar is as a store-room for storing through the winter plants used for decorating the garden, veranda, etc., in summer. Agaves and other sub-tropicals: such plants are to be kept in a state of suspended animation. The chief danger is from over-watering. Do not let the soil get "dust-dry," but be careful not to make it too wet. Besides plants, store in the cellar roots, soil, sand, gravel, moss, and whatever else is likely to be needed during the winter. Gladiolus bulbs, dahlias, cannas and other roots keep in excellent condition in a cool, dry cellar. Tigridias have to be kept in a warm, dry place, and carefully guarded against mice and rats, which will make short work of them if within their reach. Boxes are more convenient for storing than barrels, and there should be a bench that will stand rough work, though rough work is to be done. Clean up when through, and keep the cellar neat and orderly.

Improvements for Cicely's Parlor.

LYDIA HOLLY.

In reading a recent number of the AMERICAN AGRICULTURIST there was nothing that interested me more deeply than the description of Cicely's little parlor. She is indeed a true American girl, in spirit, and I would like to see her long enough to shake hands with her, and tell her what a good wife she will make for some man. There is nothing that awakens a young housewife's interest so readily as an article pertaining to home and its attractions. I am a young wife and housekeeper, and spend all my odd moments and pin money in beautifying my little home. I should be proud to show it to you, my readers, for I have made such a success of it that I would like to encourage others in the same situation.

Cicely should have a screen in her parlor to hide a corner, which nowadays we find awkward. Let me tell her of one that I have, which is a very great ornament as well as a useful article. I purchased a small clothes-horse which has three panels, and stands about four feet high. I treated it to two coats of mahogany stain and one of shellac, leaving time enough for each coat to dry thoroughly before applying the next. I then bought a piece of delicate French cretonne in dull colors, the prominent color being a dull blue-gray, and another mahogany. This I stretched tightly across the entire clothes-horse (if you please, we will call it our screen now), covering the space from the top rung to the one below only. Then I purchased enough sateen for a curtain, which I hung, with fullness enough to look graceful, from the top rung back of the cretonne, and which, finished with a hem, fell to the bottom. I was fortunate enough to find a piece of sateen of the exact shade of the dull blue in my cretonne. The screen was very pretty, and I do not believe I could do without it, for it fills a nook and adds greatly to my parlor.

I have a table which I would not part with for any mahogany cabinet table in the land, and you will wonder why when I inform you that it did not cost me as much as my kitchen table. I obtained from one of our dealers three slender canes, for which I paid ten cents each. I crossed them in the middle, and on top placed a piece of pine wood twenty-two inches square and one inch thick, nailing it securely to each cane. I purchased a pint can of inside white paint for fifteen cents, at the hardware store, and treated the canes to three coats thereof. I then obtained some white French enamel at twenty cents a pint, and gave it three coats of that, allowing plenty of time for drying. I placed on the wood a layer of cotton batting, over which I tacked a piece of coarse muslin. It was then ready for the plush. I purchased five-eighths of a yard of white plush, which I tacked tightly over the muslin. Then around the table I suspended twenty-four plush ornaments, three white and three yellow, on each of the four sides, placing them alternately. After that, I nailed some brass-headed nails straight around the table, and, after tying a yellow ribbon bow where the canes cross, my table was completed, and a daintier one it would be hard to find.

A portiere is a great furnisher, and may be obtained now at reasonable prices. Still cheaper is a very pretty portiere that can be made of common blue jean, which is used for overalls. As you all know, it is very low in price, and is of a color which nowadays is often sought for. Make the curtain of the depth of your door, and finish with a deep hem. Then, across the bottom, about ten inches from the lower edge of the hem, place a band of plush, either dark mahogany or cinnamon-brown in color, and about ten or twelve inches deep. If the poles are too costly, a very odd and pretty pole may be made of a branch of a tree, cut even on each end, and the branch itself being left rough. Give it a coat of mahogany stain, and fasten up at each end by means of small pieces of leather tacked under and over the pole. Sew the curtains on small brass screw eyes, which should be riveted in the pole. If attempted, I can assure you it will be a gratifying success.

Mrs. C. A. Todd, Cheshire Co., N. H., writes: I have been wanting to ask for help to fix my parlor ever since I saw the story published in the AMERICAN AGRICULTURIST last March, called "The Prettiest Little Parlor." Considering the amount of money you wish to spend, you can probably not do better than to cover the floor with matting. If you could manage any sort of home-made rugs, we should say, stain your floor with oak stain, and give it one coat of varnish, which will cost you but little over a dollar. Can you not cut and sew carpet rags and have them woven? Do not try to cover the entire floor with this rag carpet, but have it woven in three strips one yard wide, and three yards long. Sew these together, and have two inches of the warp left on either end for a fringe. Of course you know how to tie it to keep it from raveling. If you can do this, your entire floor covering, paint and all, will cost but $3.50. Curtain poles and rings in New York city can be had for fourteen cents apiece; we presume, if they are to be had, they will cost more in country places. We should take off both the closet and the bedroom doors, and put up poles and rings. For portieres, very handsome ones are made from bits of velvets, silk, and plush, sewed and woven like carpet rags. If you have no accumulation of these pieces, cardinal Canton flannel makes very rich and heavy-looking portieres. Put a band of old gold at the bottom, or applique with crewels, sprays cut from cretonne. You could get quite handsome portieres with wide chenille border, in large cities, for five dollars a pair, that would last a life-time. The prettiest parlors nowadays are shorn of their corners by placing a lounge or table across the corner, or a little triangular divan or seat is fitted in—your husband could do it with a bit of board. This is then cushioned, covered with cretonne, with a curtain of the same to hang to the floor, and a wide pillow stuffed and covered in like manner at either side. The seat should be built fully three feet out on either side of the wall, and slightly rounded in front. As soon as you can manage it, get white curtains with poles and rings at the windows. The simplest curtain material is a great adornment to a room. There is very pretty openwork scrim that sells as low as eight cents a yard.

Making Rooms Comfortable in Winter.

LAURA E. LYMAN.

The problem of making our rooms at once healthful and comfortable during cold weather is not an easy one to solve. Where the needs of but one person are involved there is not much difficulty in meeting them. But as families are made up—of the old and the young, the sick and the well, the robust and the delicate,—to contrive to have heat, light, and ventilation that shall suit every one requires much skill and judgment. The general rule as to the temperature of living rooms limits the degree of heat to 68° or 70° Fahrenheit. But the lean, the aged, and the invalid often demand a higher degree of heat than this to be really comfortable; while those who are young, adipose, in health, going in and out of doors constantly, and taking abundant exercise, find rooms so heated almost intolerable. Those who require a higher temperature, higher than 70°, should put on extra flannels rather than more fuel into the range or furnace.

The question of ventilation is even more difficult than that of heating. If one uses a stove the oxygen in the room must supply the fire as well as the lungs of the inmates, and unless it is constantly re-enforced from the outside it will become exhausted, and the air of the room will be unfit to breathe, both from the exhaustion of the oxygen and from the exhalations from the bodies of those who live in it. A good way to ventilate is to close the doors between the living room and the one adjoining; then in the latter open all the windows until the air is entirely renewed; then close the windows and open the connecting doors. This has been used with success in the case of invalids. Another way is to raise one of the sashes a few inches, and have a strip of wood fitted snugly in below the sash. The air will then enter upward between the sashes and will cause no draft. A hinged pane in one of the windows is an excellent thing, as is also a ventilator set in one of the panes.

The grounds around the house should be clean and wholesome. An eminent hygienic authority says: "Persons have been poisoned and killed by gas which had to travel twenty feet under the street, and then through the foundations, cellar-vaults, and flooring of the ground-floor rooms." These accidents occur in winter, the frozen ground preventing the straight-upward escape of the gas. The houses act as chimneys, and by their warmth invite the ground-air, gas, or deadly vapor which is seeking to escape. Some of the most dangerous vapors cannot be detected by our senses.

Hints About Winter Work.

KATHERINE B. JOHNSON.

With most housewives, midwinter is a season of more leisure than any other part of the year. The wearing apparel for the family was made before the holidays, and for a time comparatively little mending is required to keep it in tidy condition. By the first of March, one should be in readiness to begin the summer's sewing; but during January and February is the most favorable time for making and repairing bed-clothes, table-linen, underclothing, rag-carpets, rugs, cushions, etc. Commence as the successful merchant does, by taking a careful inventory. With note-book and pencil in hand, make a thorough examination of every closet, cupboard, bureau and chest in the house, taking note of repairs required, as well as what needs to be purchased. Some bright young minds may find their memories equal to the task, but a memorandum book is much more reliable. I take my notes at haphazard as I work, and at my leisure arrange them into lists under different heads; for instance, those requiring little, and those needing a thorough, repairing. Of the articles to be bought I also have two lists; one I call "needs," and the other "wants." In this way I often avoid the temptation to buy a "want," the doing of which might necessitate going without a "need." Most merchants in large towns now have annual or semi-annual clearance sales previous to inventorying their stock, and if you are a good judge of goods, you can take advantage of them and save quite a sum on household supplies. materials for bed-clothes, table-linen, etc. Woolen blankets, however, can be purchased most advantageously during the late winter or early spring.

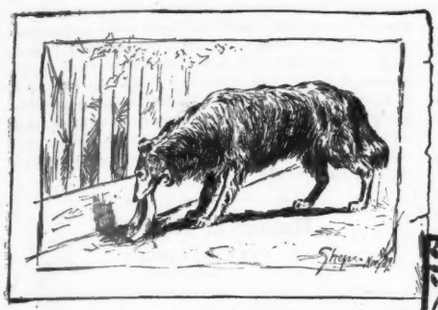
I am sorry to see so many women trying to popularize anew the old fashion of piecing elaborate bed-quilts. When one has a large family, and pieces of cotton goods necessarily accumulate; or, when one wishes to teach little girls to sew, it may be advisable to piece bed-quilts in fancy designs. But I doubt whether it is ever the part of wisdom or good taste to buy new calico to cut up for that purpose. Tacks or comfortables, made not of homely, cheap prints, but of a good quality and handsome design and color, of satine-figured, oil-boiled, turkey-red calico, striped or plaid domestic gingham, or calico, and tied (not closely, but regularly) with either white or colored Dexter's cotton yarn, are neater and more tasteful than any gorgeous bed-quilt. The mania for crazy patch-work has almost subsided, and many are now making fancy outside bed-covers by embroidering them in outline stitch with either crewels or wash-silks on heavy linen sheeting, Bolton sheeting, or the old-fashioned corded or ribbed dimity. Many of these are beautiful, but some of us are old-fogyish enough to think a bed dressed all in white is more delicate and even elegant than in any style in colors. Never were Marseilles quilts made in as handsome designs or as cheap as at present, and crocheted quilts are within the reach of nearly every one. They are not heavy to wash, and require no ironing, if carefully shaken out before drying.

In making sheets, do not commit the common error of making them short. Two and three-fourths yards is a good length, and if they are made of unbleached cloth, an inch more should be allowed on each yard for shrinkage. Single width cloth is more economical than double, where the item of sewing them together is not an expense, as, when partly worn, they can be ripped apart and the strong outside edges sewed together, thus securing quite an added amount of wear. Fancy bed-covers are made the size of the mattress below the pillows, and edged with heavy lace all around. Pillow-covers, or shams, as they were formerly disagreeably called, are often made in one piece,

and embroidered and edged with lace to correspond with the bed-cover. Knit and crocheted laces were never before as popular as now. They are used not only on decorations for beds, bureau spreads, mantel scarfs, chair scarfs, and other accessories of a chamber, but on various articles of table-linen — carvers and tray-cloths, fancy doylies and side-board scarfs. They may well become popular, for many of the designs are beautiful and easily made, while all are durable.

Table-linen should always be made by hand-sewing. German linens are most durable for common use, but any tablecloth will not only wear longer, but look much better, if an under-cloth of colored Canton flannel is used next to the table.

When preparing to make under-clothes, devote



SHEP'S LITTLE JOKE.

a day or two to cutting out a quantity—all you have on your list—keeping the pieces of each garment separate, and rolling up each by itself. Unbleached cloth wears longest and washes more easily. It can safely be bleached in a solution of chloride of lime, but if made in midwinter, and carefully laundried, will become nicely bleached by spring. All Hamburg embroideries should be washed before being made up. If they are sewed on a machine, great pains should be taken not to use a short stitch. Low-priced Hamburg embroideries are a delusion and a snare. Torchon or Medici laces wear much better, and cost little, if any more. Some of the machine-made laces are now offered in handsome designs, and are cheap and durable. If care is taken to face and stay all seams thoroughly, and to put an inner lining in hems and bands through which button-holes are to be made, much additional wear is obtained.

In this day of cheap carpets, many decry the old-fashioned rag ones. They are truly ugly when striped with a gorgeous combination of inharmonious colors; but this can be remedied by making them in the style known as "hit or miss," and there are circumstances where it is wise to make them, and rooms where no other kind would be half as serviceable. Therefore, let every housewife decide for herself whether it is the part of good sense for her to make one. If you decide in the affirmative, make it in the easiest and most expeditious manner. If you have but few bright rags, then dye some. Red is the best color to retain its brightness. Get all the rags you have together, and if you have no sewing or other out-of-the-way room, select a stormy day and invite all available hands to help, and cut a huge mass of them. As you sew, have a little orderly disorder about it; that is, insert the most prominent bright ones somewhat regularly. When finished, it will certainly be homely, but it will be less of an aggravation than the gorgeous striped ones, which dwarf every other object in a room.

I am a strong advocate of rugs, and am almost prepared to say that any kind is good, provided you have a good floor underneath. But the two varieties of home-made ones which combine more desirable qualifications than any others are the one drawn through burlap, called Turkish rugs, and the one made of old ingrain carpets. The former are both hard and slow to make, but very durable, and, in the hands of an ingenious, tasteful woman, are capable of being made very handsome, especially those in Turkish designs. Pretty ones can also be made in a manner similar to the hit-or-miss rag carpets. Buy a strong piece of burlap, put a few straight rows around the edge of any dark or neutral color, and then fill in with odds and ends of everything. The best plan is to make curves, triangles, round spots, or right angles of your bright colors, and then fill in around them with dull ones. But, if you have a half-worn ingrain carpet, you have the foundation for easily-made, handsome rugs. Cut them across the breadth about three-fourths of an inch wide, being careful to cut as straight as possible. Sew together over hand stitch, or with as little lapping as possible, and do not clip off any of the ravelings. They are woven precisely as rag carpets are woven, but it is essential that it be done by a good workman, so that they may be closely beaten together. Be sure to have warp woven in for the end hems; otherwise, they would be very bungling. A handsome, heavy worsted fringe, which comes on purpose for rugs, and can be had at twenty-five cents a yard, finishes them beautifully. If desired, two or more breadths can be sewed together to make a large rug for the center of a room, and the seam will be scarcely discernible in a very short time.

This is also a convenient time to tidy up pillows, and have feather-beds renovated and put in either clean or new ticks. Very little ticking washes well, but when faded it answers every purpose for cushions, and a bed-tick makes a good tack for using next to a mattress.

It is always disheartening to work and tug at spring house-cleaning, and then, when you settle your different rooms, have no new things to brighten them up. Think about this during the winter. Many things can be made at little expense and laid aside to be brought out at the proper time. There is an immense amount of satisfaction to the housewife whose heart is in her work, as she watches this store of pretty "homey" things accumulate, and it robs the unpleasant features of the spring campaign of many of their terrors.

"YER OLE RASSEL, YER DONE STOLE MY CAP!"

A Shepherd Dog's Joke.

R. H. MARTIN.

I once witnessed a display of intelligence on the part of a shepherd dog that was remarkable from the fact that the trick he performed and enjoyed, with seemingly human intelligence, was planned by himself without previous instruction, and was executed without assistance.

His name was Shep, and he was a handsome animal, with markings of pure white and seal brown, a most intelligent head, and a large and beautiful eye that flashed with great spirit. He was a great pet with the children, and entered into all their sports with as much zest as they.

I was standing at a window one day, when I saw Shep coming around the house with Jim's cap in his mouth. (Jim was a colored boy, ten years old, who did light chores about the place.) Looking hurriedly around, to see if he was watched, the dog dropped the cap into a hole beside the bottom board of the fence, where it was well hidden and would require a close search to be discovered. Then, with another hasty look, Shep scampered off in the direction he had come. I took a short cut through the house to see the end of the matter.

When Jim came out the back-door there stood Shep in the very spot where Jim had left him, with the appearance of having never budged an inch. But, when Jim reached for his cap on the floor beside the door, where he always placed it before he entered the house, lo! it had disappeared. Jim rubbed his eyes and looked again. There was the dog, and there wasn't the cap.

The negro boy then turned to the dog and spoke to him in the familiar way characteristic of the race, as if animals could understand human language. And, strange to say, animals do appear to understand, in a great measure, what colored people say when they talk to them.

"Yer ole rassel, w'at yer done did wid my cap?" Jim demanded of the dog, half angry, half laughing.

Shep could not answer in words; he could only act his part. He looked up into Jim's face with an expression of injured innocence, mingled with great perplexity over the sudden disappearance of the cap.

"Yer ole rassel," said Jim, threatening the dog with voice, language, and gesture, "yer done stole my cap, an' ef yer don' git hit, Jim'll beat yer brains clean out wid a club."

Finding Shep was not greatly scared, Jim sprang at him, but the dog easily and quickly eluded him and bounded off out of his reach.

"Whit! whit!" whistled Jim. "Come yere, ole feller! Nice dog! Jim won' hurt de poah dawg," pleaded Jim, kindly and softly. But Shep was not to be caught by any such trick, and wagged his tail and bounded about, and barked, and scampered away whenever Jim approached him, while his eyes fairly danced with fun and excitement. Finding pleadings as vain as threats, Jim started in a search for the lost cap, closely watched by Shep, who followed at a safe distance in the rear.

All the while he was hunting for his cap, Jim was giving utterance to threats of what he would do to the dog in the way of punishment; and if poor Shep could have understood, he must have feared greatly for the promised beatings, and the lack of food and other punishments Jim declared he was laying up for him. But Shep did not seem to take the matter at all seriously. Perhaps he thought that the best offset to the bad time coming was to enjoy as much as possible the good time he was now having. So he frisked and barked with every manifestation of delight that a dog could show. When Jim at last found where the cap was hidden, Shep barked furiously and turned and scampered off, followed by Jim at full speed, cap in hand.

But Shep was sharp enough not to let Jim catch him until he had given him a long race, as well as

time to get over his anger, and then the two could be seen rolling over and over on the green grass, the dog barking and playfully biting at Jim, and Jim caressing and extolling the dog in the most extravagant terms. And, had any one so much as offered to harm a single hair of Shep's long and glossy coat, there would have been a fight on the spot with Jim.

Furs and Furbelows.

AGNES CARR SAGE.

Truly, this is a season of fur, and numberless are the animals, large and small, which have sacrificed their warm, winter coats to protect and enhance the beauty of our city belles and winsome country girls. And how very pretty fair young faces look, nestling among the soft, luxurious folds of the long-haired black boas, or relieved by a handsome pelerine; while a huge bear-skin muff gives the stylish damsel of the period the picturesque appearance of the coquettish little maiden of the Directoire, made familiar to us by Le Brun's much-copied painting. Nothing is more dignified and handsome for elderly ladies than a seal sacque or fur-bordered wrap; while even for light evening dresses no trimming is considered so elegant as a garniture of fur, in real Russian style.

The seal-skin sacque is always in vogue, and this year varies little in shape from last, with the exception of being fitted more closely in the back, on account of the decrease in the bustle. The silk lining, however, is now put in smooth, instead of quilted. For the benefit of those who intend to take advantage of the reduced prices at the end of the season, and purchase one of these garments, it may be well to repeat the threadbare advice, be sure to buy it untrimmed, and wait for garniture until it requires making over. For those who wish to have an old cloak renovated, we would say, freshen it, and cover the shabby parts with a broad Russian collar, deep cuffs, and a bordering of some fluffy fur, such as black marten, silver or black fox, otter or sable. The jaunty, tight-fitting seal jacket is somewhat longer than last winter, and the shoulders are broadened by having the sleeves raised in early English fashion. A few have V-shaped pieces of black Persian lamb set in both back and front. These are also imitated in sealskin plush, or handsome smooth cloth, the inlaid fur pieces being particularly effective on the latter.

Never were pelerines or shoulder capes so fashionable as now, and they certainly form a most comfortable and handsome addition to a walking-suit, tight-fitting cloth jacket or newmarket, while the style of wearing them, with thin dresses on cool evenings, even in July and August, which was introduced last year, will, it is predicted, be even more popular next summer. They are rather longer than formerly, reaching to the waist at the back, and a little below in front, while both shoulders and collars are high, the latter being frequently wired on to the Elizabethan or Marie Antoinette shapes. Astrachan and Russian hare capes are the least expensive, the black bear and sealskin perhaps the most worn, and the rich Hudson Bay sable the most elegant and extravagant. We would suggest that only tall and rather slender women should adopt pelerines, for they have the effect of making small stout people appear shorter and more dumpy; or, if they think they must have them, they should select those with low shoulders. The new early English fashions are only adapted to those "divinely tall," if not "divinely fair." Much more becoming to the dear little plump women are the Russian collars of monkey skin, or the cute mink or sable cravattes which fit snugly about the neck and have the tiny head of the animal peeping over one shoulder, the bright eyes being so cleverly imitated in glass or precious stones as to be positively life-like.

The latest advices from Paris say "small muffs," but here in New York they are larger than in past seasons, round and fluffy. Flat muffs are used for very dressy occasions, but then they are generally of the same material as the costume, and merely trimmed with fur.

Have you seen the new-ribbed velvets, or fine corduroys, as they really are? Handsomer than velveteen, and so much less expensive than Lyons velvet, they are bound to win favor. They are made up so plainly that it takes but a small quantity of material, while the tans and browns are likely to prove very serviceable. The skirt is cut so as to show, in every way, the grain of the corduroy, and, if trimming is desired, it appears in the form of fringe and passementerie applied in curves. The bodice or coat is laid in long folds, from the waist to the foot at the back; while it is short in front and displays a dainty vest of silk muslin, in some light, contrasting color. A low toque bonnet of the ribbed velvet, and a shoulder cape of seal, Persian lamb, or sable, transforms this into an exceedingly smart street-costume.

Wool gowns, with full velvet sleeves, either in mutton-leg, or mousquetaire shape, are very *chic*, and as only six yards of double-width material are now required, a pretty winter frock is within the means of nearly every one. Diagonal serge, camel's hair and Henrietta cloth, are the first choice for these soft, warm dresses, which are made with draped waists and full, straight skirts, minus reeds or bustle. Quaint modes for house and evening wear are now known as "Early English" gowns. The front of the polonaise bodice is full, pointed and shirred to a half yoke of some contrasting fabric, while the back extends in coat-tails to the bottom of the skirt, or else ends off with a sharp point in basque fashion. The gathered front, drawn to a point, is finished with a girdle.

Large black satin hats are worn by young ladies, decorated with a profusion of black ostrich tips nodding in front and long ribbon streamers hanging below the waist at the back.

Gay little Zouave jackets, formed entirely of gilt or silver braid, are a dressy addition to home toilettes and tea-gowns. With the revised old styles of dressing, ample muslin fichus are once more in vogue. They fall in a low point in front and are trimmed with a vandyke collar of lace. In place of house-jackets, dainty little Carrich capes of light-tinted cashmere, lined with thin silk, are worn within doors. They are cut singly, or else in sets of three, from one, two or three colors, and fastened at the throat by a clasp or ribbon ties. A pretty finish is to border with narrow lace, or pink out the edge in scallops.

Agreeable People.

LILLIAN MAYNE.

We all know people whom it is pleasant to meet; people from whom we are sure to receive a smile, a kind word, a cordial hand-shake, or some other token of good-will. When one is depressed in spirits, or, as the common saying is, "blue," the meeting with a genial, merry-hearted friend has a magical effect; indeed, I have known the encounter with such a person to turn the whole current of one's life.

Agreeability is dependent upon many conditions; it may be inherent, it may be the result of judicious early education, or of pleasant surroundings, or of a happy combination of circumstances, but all will agree that it is a desirable quality, and whether inherent or not, should be carefully cultivated. There are people whose mighty efforts to be agreeable are so apparent and distressing as to defeat their object. Such people should bear in mind that agreeability must proceed from the heart, and in a grown person is the result of continued practice. One feels so comfortable after having said or done something to brighten the pathway of another, that it pays one's self to be agreeable.

Some people allow all their little annoyances to affect their conduct toward others, whether their unfortunate friends are to blame or not. I was once visiting a charming family. All its members, with one exception, were interesting and agreeable. The only son of the house was in business in the town in which they lived. If his affairs had moved prosperously through the day he came home in a pleasant, entertaining mood, but if anything had annoyed him he was outrageously disagreeable and rude, no matter how many guests were present. The discomfiture of his mother and sisters may well be imagined; indeed, as the dinner hour approached they were in a state of nervousness, which disappeared immediately if the "tyrant" came in with a bright face; otherwise it continued until he had relieved us of his disagreeable presence. If the fact had not been so positively demonstrated to me, I would not have believed it possible that one disagreeable person could have counteracted the influence of four agreeable people. I believe that the young man's disposition was the result of continued indulgence by his mother and sisters. He had tyrannized over them for years, and had become a powerful despot in the household.

"Tired and cross" is a common expression, and most of us know what it means. A friend of mine, a most agreeable woman, says that when she finds herself getting "tired and cross," she takes a nap, a bath, a walk, or a drive, goes to see some one whose walk in life is less pleasant than her own—does anything different from the work that has tired and worried her. In this way she preserves health and temper, governs well her children, and keeps her entire household in a state of peace and happiness.

Many parents do not realize that in training their children a regard for others should be instilled into their minds. A spoiled, selfish child may be very dear to its parents, but after the parents have passed away and the child has become a disagreeable man or woman, what disinterested parties will tolerate the selfish, tyrannical ways of such a person?

There are people who have hosts of friends—people whose presence is always sought by both old and young—people who are supposed to have been "lucky," when in fact they are simply unselfish and agreeable.

Manners at Meal-Time.

MARY W. EARLY.

Our meals should not only serve to satisfy our hunger but should be made occasions of social enjoyment. Physicians tell us that food is far more nourishing and digestible when eaten amid cheerful conversation. Silence and gloom spoil the choicest viands, while jarring words are still worse. Therefore let us banish every unpleasant topic from the table—everything that can annoy, excite, or occasion controversy, and let us systematically cultivate cheerful and pleasant table-talk.

There is no place where character and breeding show more plainly than at the table. A vulgarian might more successfully conceal his ill-breeding anywhere else than at the table. We may form a pretty shrewd guess as to the daily life and surroundings of a person by watching him narrowly at the table. You can, for instance, easily judge whether he has been accustomed to home or hotel life. If the latter, he will probably go ahead with his meal, unconcerned about any one else, helping himself to whatever may be near him, without a thought of offering it to any one else. In home life, on the contrary, we are trained to consider the wants of others, at the table and elsewhere, and to feel a degree of responsibility about them; and those who are thoroughly imbued with the spirit of home life do not lose this feeling entirely, even in public places and amid strangers.

Every housekeeper has a right to insist that the members of her family shall promptly obey the summons to meals, else she will undergo great annoyance, loss of time, and derangement of her domestic routine. The food, too, loses much of its excellence by standing, and getting cold and stale. No matter how deeply you may be interested in any pursuit, how much absorbed in any book, go promptly to the table when meals are announced, even if you leave the hero and heroine at the most critical point of the story.

Children should be required to observe the rules of neatness and courtesy at their meals. In this way only can you secure quiet and orderly meals, and send forth your children into the world with refined table manners. Boys, being naturally rough and turbulent, need stricter watching and drilling than girls. Insist on their sitting squarely on their chairs, instead of sideways and crooked, as they so much prefer doing. Make them pull up their chairs in front of their plates, use their knives and forks properly, keep their elbows off the table, and be careful not to spill things. I have seen persons flee with dread from a seat next to half-grown boys and girls whose parents had neglected the table drill I have indicated above. These children not only stuck their elbows into other people, but "scattered plenty," not over "a smiling land," but a frowning neighbor, spilling soup, gravy, and other articles on the clothes of the ill-fated persons who sat next to them. If we carefully train our children in the courtesies of the table, we not only improve their manners, but assist in their moral training. For instance, when we train them to sit quietly in their places, awaiting their turn to be served, we are teaching them a lesson in the great art of waiting and exercising patience, and

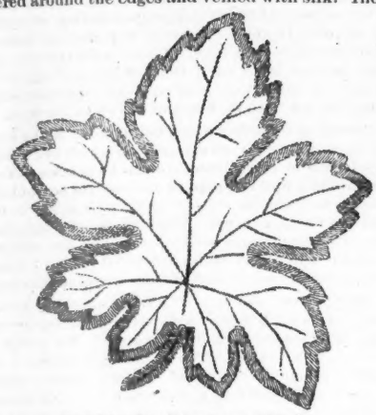
this lesson will prove of priceless value, in later life, and in weightier matters. Then they have opportunities at the table to learn many a lesson of consideration and unselfishness toward others.

We enjoy our meals far more if our eyes are gratified, in addition to our palate. It is highly important to have a neatly set and tasteful-looking table; and every woman may do this, nowadays, when table-linen and table-ware may be procured on such reasonable terms. But the crowning ornament of the table should be, whenever practicable, a glass of flowers. Gladdened by their fragrance, and cheered by pleasant and entertaining conversation, our meal times will serve to refresh both mind and body.

For the Dining-Table.

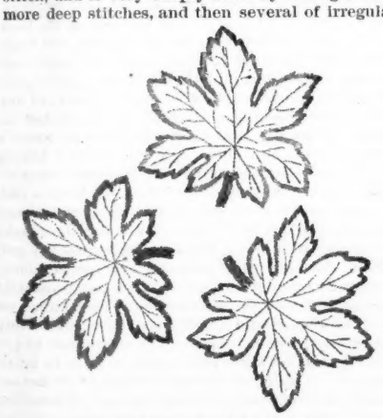
ALICE CHITTENDEN.

One of the newest decorations for the dining-table consists of a set of six large leaves, embroidered around the edges and veined with silk. They



EMBROIDERED LEAVES, FIG. 1.

are made from linen drilling, of a heavy quality, and are seven inches from base of leaf to tip. A large grape-leaf will furnish a pattern, or you can have them stamped, or buy them in stamped sets of six for fifty cents. They are embroidered in buttonhole stitch fully three-eighths of an inch deep, or in what is called long and short buttonhole stitch. This is handsomer than the solid stitch, and is very simply done by taking one or more deep stitches, and then several of irregular



EMBROIDERED LEAVES, FIG. 2.

lengths. Our illustration, Fig. 1, shows the solid stitch. The veining is done in close outline stitch. Use filo silk (directions for washing which come with each skein) for the long and short stitch, and twisted silk for the solid. Get the metallic colors, a different shade for each leaf; pale blue, pomegranate, old gold, pale green, and bright red are the colors usually chosen. From the base of the leaf work a curved stem an inch and a half long in two rows of buttonhole stitch. After embroidering, the leaves are cut out and pressed on the wrong side, laying them face down on soft flannel. They are arranged in different ways; around a center-piece of fruit and flowers, as shown in Fig. 2, or three in opposite corners of the table, and, in either case, make an exquisite bit of color. They will last a long time without washing, and, if you are afraid of the colors fading, instead of washing when they become soiled, tint the spaces between the veining with tapestry colors. Sometimes a single leaf of double the size is used, and white linen floss is used, instead of the colored silks, by those who prefer white alone for the dining-table. Omitting the stem at the base of the leaf, they are used as doilies. The silk is four cents a skein, three being required for each leaf if the stitches are laid as deep as they should be.

A Hanging Pincushion.

The cover of the handsome cushion seen in Fig. 1 is six and one-half inches long, seven inches wide, and in shape resembles a small bolster. It

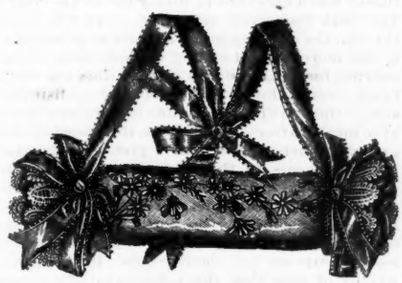


FIG. 1. HANGING PINCUSHION.

consists of a piece of pale strawberry-colored satin, decorated with embroidery and satin strings and bows. After the design given in Fig. 2 is transferred on the satin, work the flowers and buds in ribbosenes of varied colors and shades; the stems and vines with embroidery silk, in olive and bronze shades. Stuff the cushion with soft wadding or sawdust, liberally shaking sachet powder into it. Sew the satin over the little bolster, and cover the seam with a gold cord. Gather the ends and fasten them; then make two rosettes of strawberry-colored ribbon, two inches wide and nine inches long; surround these with gold lace, gathered as full as the ribbon, and join them to the cushion, sewing on the strings—each of which should be ten inches long—at the same time. Then finish the whole by tying bows around the ends and in the middle of the strings, as seen in Fig. 1.

Value of the Flesh-Brush.

WEBB DONNELL.

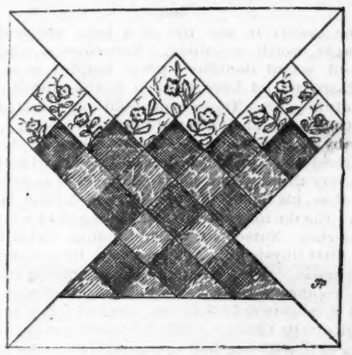
It is well known that muscles put to any unusual or severe strain are likely to suffer lameness and soreness. Sometimes this paves the way for rheumatism. A brisk rubbing of the parts that have been overworked will save subsequent lameness. If the lower limbs are treated in this way after an unusual and fatiguing walk the naturally-expected lameness will be quite sure to be missed the following day. Those who find it difficult to get to sleep at night should try the experiment of giving the body a brisk and thorough rubbing just before retiring, using the palms of the hands, or a moderately stiff towel, or flesh-brush, while the effect in freeing the pores of the skin from deleterious matter would be beneficial to the general health. With babies, a gentle but thorough rubbing of the whole body with the hands at night not only quiets the nerves and renders the little ones generally comfortable, but induces refreshing sleep. This is a fact with which many mothers are unfamiliar, but which, if followed, would add much to the comfort and well-being both of themselves and their children. Harsh or long-continued friction is to be avoided, since this would irritate the skin and cause discomfort. To assist in freeing the pores of their impurities, a gentle pressure or kneading of the surface of the body is beneficial for those who are somewhat advanced in years.

FIG. 2. EMBROIDERY DESIGN FOR PINCUSHION.

Square for a Cushion-Cover or Quilt.

FRANCES H. PERRY.

One hears frequent demands for new ideas in patchwork from those who are tired of crazy-work, but still wish to fashion pillows, cushions, quilts, etc., from the pretty bits of silk and velvet that will accumulate so fast. The design here given is a useful one for that purpose, for by it one can dispose of pieces of varying shapes and sizes. As represented, the small dark squares are of plain velvet, the gray ones are of watered silk, in a lighter shade, the figured ones are brilliantly-flowered brocaded satin, or velvet, and the larger parts surrounding them all, the foundation parts, are of plain gros-grain silk or satin. Cut the design into four pieces by cutting across each way diagonally from corner to corner, and one can see how each of



PATCHWORK SQUARE.

the quarter sections may be easily pieced, then seamed together. For a pattern twelve inches square, when finished the small pieces should each be two inches square; the larger, plain portions, must be cut to match, or finish out, the pieced parts of each triangular section. This is a pretty size for a quilt; and cambrics, satines, or prints might be used if preferred. Of course, in a quilt the plain outer portions of the squares should be of two different colors or shades. Half of the squares should be finished with one color, and the other half with the other, and should then be arranged to alternate across the quilts. Inch-and-a-half squares, cut from the small sample packages one gets when buying dress-goods by mail, produce a nine-inch square when completed; four of these make a pretty chair cushion.

A Pretty Crochet Pattern.

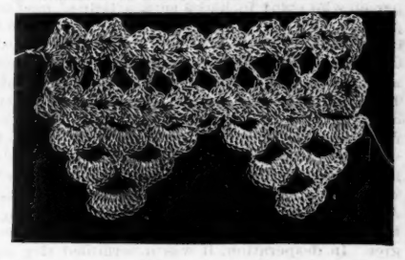
MRS. M. HOWARD.

Make a chain of ten stitches.

1. Make a shell of three double, one chain, three double crochet in fourth stitch, two chain, three double, one chain, three double in the eighth stitch, making two shells in this row, turn.

2. Three chain, shell in shell, three chain, fasten down with one single to the first double stitch in shell of second row, another shell in shell, turn.

3. Continue to make shells until there are two



CROCHET LACE.

rows of eight shells each, then make one chain, fasten in shell of preceding row, make five chain, fasten with single stitch between fifth and sixth shells along the edge, make five chain, fasten between the third and fourth shells, again make five chain, fasten between first and second shell, turn.

4. Make one single, ten double, one single in

five chain, fasten down with one single in chain of preceding row, one single, ten double, one single in second chain of five, fasten down as before; then make one single, five double, and turn.

5. Make a chain of six, fasten in the fifth double stitch of scallop of the preceding row with a single stitch, chain six, fasten in next scallop center by a single stitch, turn.

6. One single, ten double, one single, in six chain, fasten down to preceding row, one single, five double in next chain, turn.

7. Make six chain, fasten with one single in five double of last scallop, turn.

8. Make one single, ten double, one single, in six chain, fasten down with one single stitch in fifth double stitch below, then make five double to finish the scallop in second row, fasten down with one single in fifth double in third row; make five double, one single in last scallop of third row.

This will finish it. Then make three chain, shell in shell as before. Repeat from the third row.

The Trials of a Baby.

MRS. J. M. MILLIGAN.

The events in the life of a baby are seldom thought worth recording. Nevertheless, such a record would doubtless prove helpful to many mothers, and of keen interest to the subject of it in future years. These considerations resulted in writing the following bit of veritable history:

Baby L., born July 19th, at 2 o'clock A. M., weighed seven pounds. He was strong and active, but very thin. When he cried, which was most of the time, his mouth seemed to stretch from ear to ear. The doctor said he had the head of a metaphysician. Nurse, not understanding, called him the little physician. At two weeks he gave us his first smile. At ten weeks he began making voluntary cooing, gurgling sounds from his throat. It was curious to note that this soft baby-talk would often startle himself, while his most lusty cries of pain or impatience had apparently no such effect.

Six weeks passed, and not one night of unbroken rest had come to the household on account of the dreadful colic, or whatever it is that causes so many little ones to cry during the first months of their existence. Paregoric proved an effectual remedy in violent attacks. One drop in a teaspoonful of water was given at first. It was found that the quantity had to be increased at each subsequent dose to have any effect. However, this drug was seldom resorted to, on account of its effect on the nerves, causing the child to start and moan in his sleep. Other remedies tried were toddy, catnip (an infusion of the flowers), syrup of rhubarb and magnesia, charcoal and loaf-sugar, assafetida and paregoric, anise and calamus. Each of these had a fair trial, but the boy cried on and on. Many nights two hours measured the time we got for rest, and not seldom half that time was all that was allowed. When the babe slept, quiet reigned supreme in the house, door-hinges were oiled, conversation was carried on in whispers, and silent feet walked tiptoe. The remedies not only failed to help, but seemed to have a more or less injurious effect. Catnip affected the kidneys, calamus constipated the bowels, the other things increased the irritability of the stomach. The little one grew thinner week by week, and, as the mother was in feeble health, it was finally concluded that her milk was not of sufficient quantity or of suitable quality.

Then began another round of experiments. Each person who came in had a new article of food to propose, or a different preparation of what had been tried. It was decided to give a three days' trial to each of the foods suggested that seemed most reasonable until the right one was found. Three more weeks passed wearily and sadly enough, for the baby gave no evidence of improvement, and we began to think he would die for want of nutrition. The foods given were cow's milk or cream mixed with water; they were tried with and without sugar and starchy additions. All these preparations seemed to cause vomiting, hiccoughs, and flatulency, in a greater or less degree. In desperation, it was determined that as the child's natural nourishment, drugs, teas, "old women's remedies," and manufactured foods had all failed, we would try cow's milk pure, and persist with it unless there were evident signs of harm. For four or five days there was little to encourage us, but O, joy!—after that the baby cried a little less, looked a little less pinched, was less wakeful, and vomited less. As his new diet was continued, a marked improvement was visible from day to day.

A small flask bottle of *clear* glass, fitted with a black rubber nipple, was found to be the best medium for giving him the milk. The process of sucking accomplishes for the infant what mastication does for those of older growth; naturally, whenever the boy was fed from cup or spoon, he gave proof of less perfect digestion. Great care was taken to give the milk at the right temperature, and to keep the bottle and nipple clean. They were rinsed in *cold* water as soon as emptied, next in warm, weak ammonia water, then the flask was filled with fresh water and the nipple put in a cup of the same until needed. A little tin funnel was a great aid in filling the bottle neatly. The milk was given regularly every two hours through the day, beginning as early as practicable in the morning, and ending the last thing before retiring for the night. In a short time the whole family were allowed their quota of undisturbed sleep. Only two tablespoonfuls of milk were given at a meal. After a few weeks, this quantity was gradually increased to half a pint, and the time between meals to three hours. Of course, the quantity was increased to meet the child's demands as he grew older. We could always tell when he had enough. The bottle would drop from his mouth and an expression of beatific content would settle on his countenance. It was a fact worthy of note that the morning's milk agreed with the baby better than that milked in the evening. Probably the cool quiet of the night allowed the cow to secrete milk of a more healthful character than that made through the day, when she was exposed to irritation from heat, flies, or other agencies. It should also be noted that our cow was not fresh, as is commonly thought necessary in such cases. In the first days of experiment, milk from a cow with a young calf was tried, but as the child did not thrive on it, it was soon changed.

Baby L.'s trials ceased rapidly after his introduction to his foster-bossy-mother. He became a fine, healthy child, unusually large and active for his age. However, months of patient, persistent care were required to overcome the injury done to his digestion and disposition in those early days of experimenting.

The First Valentine.

DORA HARVEY VROOMAN.

Who does not remember her first valentine? I remember mine and the feelings it called forth quite as distinctly as though it had been but just received. I was a wee little tot, and it was—no, I daren't tell how many years ago. I could not at first imagine from whom it came. The mystery only made it seem more precious. At last, hidden among the roses, I found two initials. Then I knew, but I held my secret. One day, at school, the sender, blushing red as a peony, said: "Say, Dolly, did you ever find out who sent your valentine?" "Why, who told you I ever got one?" asked I, in apparent surprise. "Nobody," mumbled he; and even now I smile as I think how disappointed he looked because I did not acknowledge that I knew he sent it.

Japanese Dolls.

HARRIET P. RICHARDSON.

Something novel and pretty for a sachet-bag is a Japanese doll, about six inches tall, dressed in the figured squares found in Japanese stores. The skirt is, in reality, a large puff, made of several squares sewed together, and, when finished, about ten or twelve inches in diameter. The skirt is filled with cotton, sprinkled with sachet powder. Ribbons of any bright color ornament the waist, and a tiny fan is fastened in the doll's hand. Placed in a gilded parlor-chair, the doll appears to be sitting down, and is considered quite the cutest and newest thing in parlor sachets.

For Freckles.

A young lady correspondent requests a cure for freckles. The golden-brown variety, that appears only in the summer, may be readily removed, but those of a more permanent kind are difficult to get rid of, and many can only be mitigated by an acid lotion and avoiding extreme exposure to the sun. We give a few simple remedies, recommended by the best authorities, and hope they may prove of use to some girlish readers, who, however, may console themselves with the fact that the distasteful brown specks are an evidence of a good complexion.

Take finely-powdered niter (saltpeter), and apply it to the freckles by the finger, moistened with water and dipped in the powder. When perfectly done, and judiciously repeated, it will often remove them effectually, and without trouble. One part of good Jamaica rum and two parts of lemon-juice, or weak vinegar, forms an excellent freckle-lotion. Another may be made of two gallons of strong soapsuds, to which are added one pint of alcohol and a quarter of a pound of rosemary. Keep in a close jar, and apply with a linen cloth. Please remember that what will help in one case may be quite useless in another.

Kitchen Lore.

Rice with Cheese.—Boil half a pound of rice; drain and shake dry; put a layer of this in a pudding-dish, season with salt and pepper and dot with bits of butter. Grate a quarter of a pound of cheese, and sprinkle each layer of rice with the cheese. Let the last layer be of rice. Whip one egg with a gill of milk, and pour over all; sprinkle with crumbs, dot with butter, and brown in the oven.

Oyster Salad.—Bring to a boil a dozen and a half of oysters in their own liquor, to which two tablespoonfuls of good strong vinegar have been added, with white and red pepper and salt for seasoning; drain, and cut the oysters in dice so as not to injure their appearance. Wash a head of celery and cut the edible parts in dice; mix with the oysters, and keep in a very cold place until ready to serve, when cover with a mayonnaise or salad dressing.

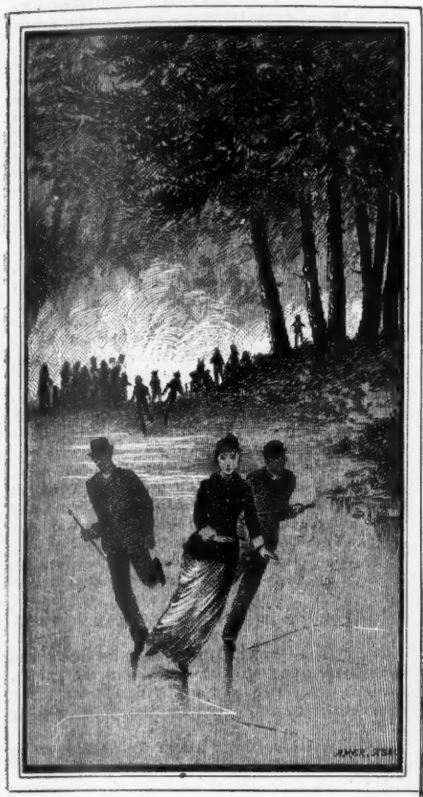
Oysters and Bacon.—This is a somewhat novel way of cooking the luscious bivalve, called by our English cousins "Pigs in Blankets." We prefer it without the name. Have as many thin slices of salt (not smoked) bacon as you have large oysters; wrap each oyster in a slice of bacon, and fasten with a tiny skewer—a small wooden toothpick will do; have ready a hot frying-pan, and lay them in side by side, turning to allow the bacon to color slightly all round. Have a tiny square of thin, buttered toast for each one; add a tablespoonful of butter and a spoonful of milk or cream to the liquor in the pan, pour this equally over the toast, lay one of the rolls on each, and serve.

Making Stock.—There is a great deal of unreliable information going the rounds of many papers, professing to tell how to run a stock-pot. Such as, for instance, that a vessel can be kept on the back of the stove, and bones, scraps of meat and vegetables put into it after each meal, and kept constantly simmering, and that from this mess good soups can be obtained. If there is a family of any size, there should be enough of the bones and remains of poultry and meat and game to make a soup at least four times a week without buying fresh meat for the purpose. The most satisfactory way to do this, however, is to keep a dish in your larder or ice-box, to receive such bits and the cold gravies for a day or two, and then make as much broth from them as their quantity will allow. In a boarding-house, or a very large family, it may be possible to keep a stock-pot constantly simmering, but the broth should be strained off and the bones and vegetables thrown out every twenty-four hours. Vegetables should not be put into it until an hour before the soup is to be removed. If soup is to be boiled three hours, use one quart of cold water to every pound of bone and meat, in the proportion of one of the former to three of the latter. If it is to boil six hours (and where time is no object this should always be allowed), add two quarts to every pound of meat; this will reduce to one quart by boiling. The boiling must be slow and steady, and the skimming must be thorough. Inattention to these details clouds the stock and makes it dark. About one hour before the stock is done, add the usual bunch of soup herbs, one carrot, one turnip and one onion stuck with three cloves. This is the proportion for four quarts of plain stock. Simmer an hour longer, strain into an earthen jar, and leave it stand to cool, *uncovered*. If there is time to let it get perfectly cold, the fat may be removed in a solid cake; if not it may be skimmed off, and in either case it is excellent for frying. Many housewives do not find it necessary to use a bit of lard, preferring beef suet tried out and mixed with the clarified fat from the top of soups.

Winning the Skates.

J. J. STEARNS.

Half a mile from the source of the Stane river is situated the little village of Velklein, and three miles below this begins the city of Bourkof. In the latter are five waterfalls, but the nearest is six miles from Velklein, and affords power to turn the spindles of the largest cotton-mill of the neighborhood.



THE RACE FOR THE HOCKEY.

In the winter of 1872 the whole river was frozen from the village to the mill, and all the boys and many of the girls spent most of their leisure time on the ice. In the evenings many older persons joined them, and bonfires every half-mile gave a ruddy glow to the ice-fields. So interested did the good people of the vicinity become, that a committee of the mill-owners finally agreed to offer a pair of handsome skates to the one adjudged the best skater at the close of the year.

The prize was exhibited in the largest cutlery store in the city. Bright silver formed the soles, polished steel composed the runners, and burnished gold adorned the projections on either side. Never was such a pair of skates seen before, and the hearts of every boy and young man thumped with excitement every time he passed the show window. Skating clubs were formed, and races between the most proficient members were of nightly occurrence.

Near the river banks and just above the village was a house where dwelt Peter Vichlom, his wife, and his daughter Enna. He was a Russian exile, escaped from Siberia, but an intelligent and industrious man. He was now a teamster for one of the mills, but had evidently seen better circumstances and occupied a higher position. Some said he had even been a prefect or judge in his native country.

Enna Vichlom was now a tall, dark girl of seventeen, larger and stronger than any other girl of her age, and universally liked for her good nature and her quick intellect. She was spry and agile, and used to go to market every Saturday for her mother. When the ice came she often skated to the city, as skating was so much easier than walking. She could outrun, outswim, and outskate every girl of the neighborhood, and some of her friends boasted that she could skim over the ice more swiftly than Will Ennis or Fred Carter, who had distanced all other competitors. Will Ennis was the son of a village carpenter and Fred Carter was a nephew of Mr. Furbush, who owned the largest cotton-mill.

One evening, just as the two young men were starting to take position for a race, one of the girls called out:

"Why don't you challenge Enna? She has beaten us all, and I think she can at least keep up with you."

"Come along, Enna," said Will Ennis. "This race is open to all comers."

"If you can beat us to-night you shall have my prize hockey," said Fred Carter. "You know I won that two years ago," and, as he spoke, he held up a magnificent redwood hockey with a silver plate that had been awarded to him for outskating all the boys of the city.

Enna modestly took her station between the other two, and, at the word, all three started for the "double bonfire," as the goal was called, because here there was a fire on either bank to light the bridge and warn the skaters of the falls below. The starting-point was the "old log-house," a rude hut built originally for a camp, but now unoccupied. It was some four miles from the bridge.

Down the river sped the rivals, and after them in a long, dark line came the other skaters, a few of whom could manage to keep the racers in sight. Many, however, turned aside and skated aimlessly until they should return.

"Enna's ahead! Enna's ahead!" soon sounded down the river. The three were returning, Enna indeed in advance, and Will and Fred almost on a line less than a rod behind. But soon the two young men forced their way past, Fred tauntingly waving the cherished hockey as he swept before his fair competitor.

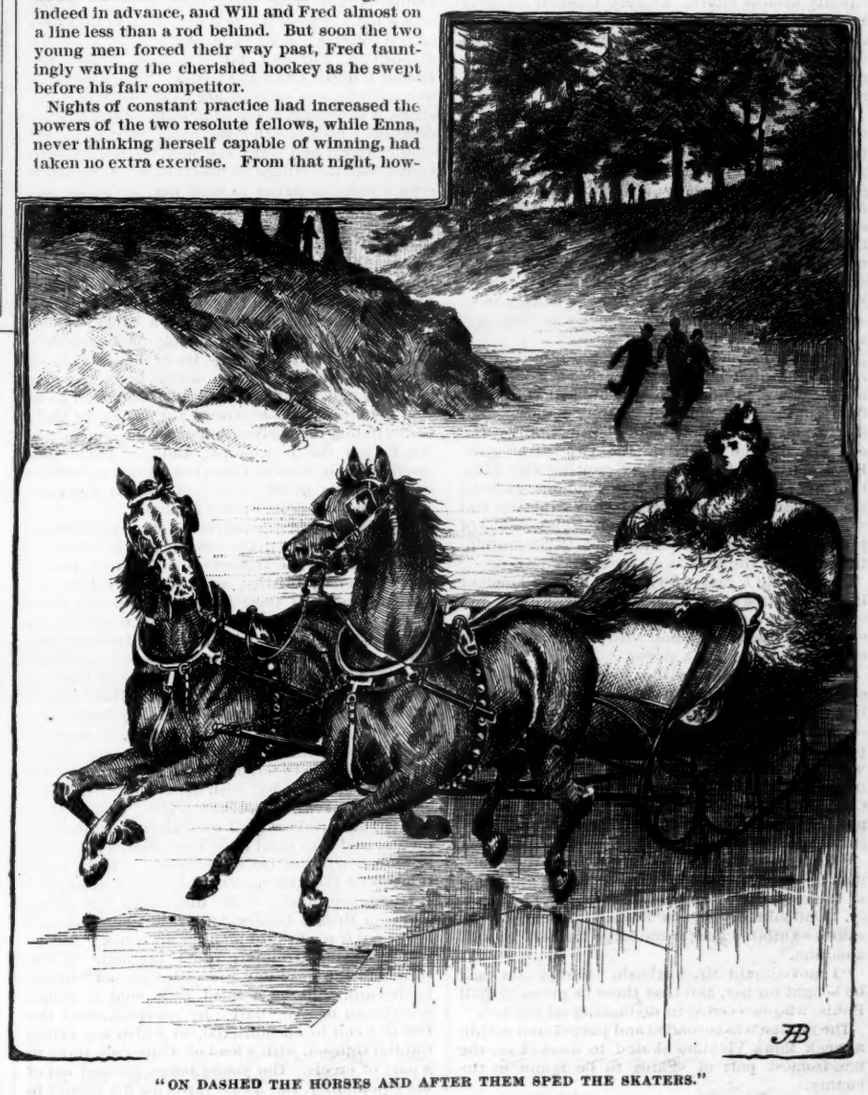
Nights of constant practice had increased the powers of the two resolute fellows, while Enna, never thinking herself capable of winning, had taken no extra exercise. From that night, however, she spent every spare moment on the ice, and as she lived almost at its edge she could reach it long before her young friends. Often when they came she had returned home and declined to accompany them in their sports, for she had resolved not to race again until sure of victory.

Finally, the last race was announced for December 29th, and the winner in that race was to have the skates. Three evenings before, Enna again joined the skaters, but resolutely declined to race. Many were disappointed at this decision, but others gave as an excuse her want of practice, not knowing that every evening she had had an hour's steady work before their arrival.

The races had attracted so many visitors that many came in sleighs to witness the sport. All the vehicles had to take the road to the upper bridge before they could reach the ice. No one thought of this in coming, but when the skating was over and the fires had died out, some found the drive up the river and down the road a rather long way of reaching home. As for the skaters, they always refused to ride and took the footpath nearest the lower bridge.

It was December 28th, the last day before the final prize. Every face turned toward the sky and then toward the river on that blustering morning. No one complained of the cold. If it would only continue, the race would be decided in splendid fashion.

When evening came, the river was crowded with skaters and their friends. Among the latter were Maud and Annie Furbush, cousins of Fred Carter. They came in a fur-covered sleigh drawn by two black horses, which were carefully driven by Paul Durham, their father's coachman. The girls were in the habit of driving, but Mrs. Furbush thought that Paul had better go with them on the river, as



"ON DASHED THE HORSES AND AFTER THEM SPED THE SKATERS."

the horses were not used to the ice. But there seemed little room for her fears as the beautiful steeds, with arched necks and jingling bells, trotted slowly down from the upper bridge under Paul's firm handling of the reins.

"Oh, Paul, there's Enna," said Maud. "Just step over to the bank and ask her to come here, won't you?"

Enna was standing in the midst of a group of girls who were coaxing her to race once more with Will and Fred, who stood near by. Several little girls were skating between her and the sleigh in which sat Maud, holding the reins and chatting to Annie while they waited for Paul to return with Enna. As the group parted to allow them to pass, one little girl, just learning to skate, fell on the ice and rolled over and over, having caught her foot in a scarlet cloak that she wore.

Maud had just let go the reins and was holding her hands out to Enna, when the horses, startled by the red cloak rolling rapidly toward them, gave a spring and the next instant started down the river—not running, but trotting rapidly, and dragging along the sleigh containing the two frightened girls.

In a minute the skaters were in commotion. Instinctively, Will, Fred, and Enna started after the team, shouting to the skaters near the bonfires ahead to stop the horses. Maud and Annie clung to each other in desperate fear, but had sense enough to remain silent.

On dashed the horses, and on after them sped the swift skaters, Will and Enna almost together and Fred only a few yards behind. At last some of the fire-tenders caught sight of the team and rushed to the middle of the river to stop them. But the cries only frightened them the more, and they dashed on, to be met at the next fire with an equally useless effort. As they reached the next bonfire, which was the fourth above the double one near the bridge, a determined rush turned them aside, and the horses, overturning the sleigh, started in the other direction and dashed up the river.

Uncertain what to do, the three skaters stood a moment irresolute, and then, urged by a common impulse, turned and followed them, all three together, as if they had just received the word to start. But the horses no longer kept a straight line; the swaying sleigh, bumping on its side at every step, seemed to pull them from one side to the other and their course became a zigzag line up the river. It was this fact that permitted the skaters to keep near and soon to reach them. Enna was now in advance, and the horses were approaching the group near which they had first started.

By a mighty effort, Paul Durham clutched the rein of the nigh horse and nearly pulled him to his haunches, although he was himself thrown at full length. In a moment, willing hands seized the two horses by their heads. Paul's only anxiety was for the safety of the two little girls. Enna, Will, and Fred stood by, panting with exertion and excitement, when a few moments after a skater from near the lower bridge came up and said the girls were unhurt. Then exclamations of joy resounded on all sides and hearty congratulations greeted the girls as soon as they arrived.

"We needn't race, now," said Will, a moment later; "Enna was far ahead of either of us."

"To-morrow night, we'll try again," said Fred; "but now I must go home with my cousins, especially as it looks like a storm."

The sky was indeed rather lowering, and all the skaters soon left the river. Before morning it began to snow and by ten o'clock it was raining so hard that no one thought a race could take place that evening. The thaw continued for a week, but before it was over a notice was published, asking all the skaters to assemble in the City Hall. The object of the meeting was not announced, and the young people were natually very curious to find out what was to be done.

"We have called you together," said the chairman of the meeting, who was one of the aldermen of the city, "to award the prize to the best skater. Undoubtedly she is Enna Vichlom, but the skates exhibited are far too large for her. I await a motion."

"I move," said Mr. Furbush, "that a new pair be bought for her, and that these be given to Will Ennis, who succeeded in distancing all but her."

The motion was seconded and passed, and within a week Enna Vichlom skated to market on the handsomest pair of skates to be found in the county.

Fritz and Fanny.

A. H. SHELDON.

Fritz is the name of a large black-and-white dog, while Fanny is a very small black-and-white kitten, and a great friendship has sprung up between these two animals. Every morning Fritz takes his place on the porch, waiting for his young master to come down stairs, and when Fanny sees her friend, she runs up, right under his great head, and rubs herself against him, looking up into his face, and seems to say, "Good morning, Fritz; glad to see you." Then the dog jumps about, patting Kitty with his paws, picking her up with his mouth and setting her down again as carefully as her own mother would. When the milk is put out for them to drink the other cats stand back at a respectful distance, but Fanny is not afraid of being barked at, so she puts her head right into the dish and enjoys her breakfast with her big playfellow. Such instances of affection between dogs and cats are not very common, but show that it is much pleasanter to enjoy the society of others, even if they are not quite like ourselves, than it is to be at enmity with those around us. Every big boy has some tender place in his heart, and kind words and actions will usually make him gentle.

The First Pigs in Scotland.

Pigs were little known in Scotland until the eighteenth century, and amusing stories are told of the wonder and fright of the people at the appearance of the fat domestic animal now so common on every farm. About 1720, a gentleman living in Dumfriesshire, who was called the "Gudeman o' the Brow," received a present of a fine young porker from some distant place, which seems to have been the first ever seen in that part of the country. This little pig was of a roving disposition, and one day wandered across the Lochar into the adjoining parish. Here a peasant woman, who was herding her cattle near the seashore, was terribly alarmed at sight of the strange creature, which, she thought, came grunting up out of the water, and away she fled, screaming with terror, into the village of Blackshaw. Naturally a crowd soon gathered around her, to whom she declared that a de'il (devil) came out of the sea, with two horns on his head, and chased her, roaring and gaping all the way at her heels, and she was sure he was not far off! At this the rustics were sadly dismayed, but an old schoolmaster said bravely that he would "conjure the de'il," and proceeded at once to bring out a Bible and an antique sword; but when suddenly the little swine started up, grunting, at his back, the courageous pedagogue was so frightened that his hair fairly stood on end, and they bore him half dead from the field. The whole crowd then took to their heels, hiding themselves in barns, and even climbing up on the house-tops; and the panic continued until one who had seen the foreign gift called out, from his perch on a roof, that it was only "the gudeman o' the Brow's grumphy."

Next day the pig was conveyed across the Lochar, and his head turned in the direction of the "Brow;" but, on the way, he trotted up, in the dusk, to two men gathering thistles, who, as startled as the woman, mounted their horses, and would have ridden home, but, the strange animal getting in their road, they were driven into the Lochar moss, where one of the horses was drowned, and they remained all night, not daring to speak above a whisper, for fear the monster should discover and devour them. When, finally, morning broke, and they succeeded in making their way, by another road, home to their anxious families, they had a remarkable tale to tell of having seen "a creature about the size of a dog, with horns on its head, and cloven feet, roaring out like a lion," and, if they had not galloped away, it would have torn them to pieces; and they must have been somewhat crestfallen when one of the wives cried: "Hoot, man! it has been the gudeman of the Brow's grumphy! It frightened them a' at the Blackshaw yesterday, and poor Meggie Anderson maist lost her wits, and is aye out o' a'e fit into another sin syne." Meanwhile, Master Grumphy spent his night in the corn, and the next day proceeded on his journey homeward. But he a third time sent a canny Scotchman nearly "daft" by snorting about the feet of a colt he encountered, on which was riding Gabriel Gunson, with a load of white-fish, slung in a pair of creels. The young horse, startled out of his equanimity, ran away, throwing his master in the road, and when Gabriel, on picking himself up, spied the pig not far off, he took to the woods, and remained hidden there for twenty-four hours, and until he was completely exhausted, while terror excited his imagination to such an extent that he afterward described the innocent little porker as "big as a calf, having long horns, eyes like trenchers, and a back like a hedgehog." Poor Gabriel! It was a sad encounter for him, for he lost his fish, his colt was ruined, and he himself fell into a consumption and died in a little more than a year. Truly, Mr. Grumphy had a good deal to answer for.

It was shortly after this that a vessel came into port, a little below Dumfries, with several swine on board; and one, getting loose, the country people took it for a badger, and turned out, with clubs and swords, to capture it. One man, named Robs Geordy, was courageous enough to run the strange beast through with a pitchfork, and, for this deed of valor, he was known as "stout-hearted Geordy" all the rest of his life.

Gyp.

HENRY D. TAYLOR.

"Mamma, may I have a piece of bread and butter?"

"Yes, dear; ask Katie to give you some. I can't go to the kitchen now; I'm busy."

"Katie says she won't give me any more, 'cause I've had some."

"Tell her Mamma says you may have another slice, and she will."

Little Alice started for the kitchen with Mamma's message, and Katie gave her the bread, but, as she went out into the yard, Katie went up-stairs to her mistress.

"Mrs. Wilson, I don't want you to think, mum, that I don't want to get the bread for Alice, but she's had three cookies, two pieces of bread, and some cold meat before, and I don't know whatever she can have done with it all."

"I wish you would see what she does with it, Katie; I am busy just now, and cannot do it myself."

"So I will, mum. Perhaps she's feeding some of the poor folks."

Mrs. Wilson thought this was quite likely, and so did not give the matter a second thought till the girl came back, saying: "Oh, mum, will you come out here and see what the child's a-doing of?"

"What's the matter?" asked Mrs. Wilson, rising hastily and following Katie.

Just back of the house sat Alice on a stone, feeding a large Newfoundland dog. As they came near the dog growled at them savagely.

"Why, Alice, come right away from the dog. He will bite you."

"No, he won't, Mamma. See how he loves me," and the little girl threw her arms around the dog's neck.

Mrs. Wilson was terribly frightened, and started to take her daughter from the dog, but the way he showed his teeth made her change her mind.

"What shall I do? I'm so afraid he will bite her."

"I don't think he will, mum. She's been feeding him, and he seems to like her. Perhaps if she would come to you and the dog should see that you wouldn't hurt her, he would let you take her into the house, and then he would go off."

"Come, Alice, come to Mamma. I want you to go over to Aunt Mary's with me," said Mrs. Wilson, holding out her hands to her.

"Oh, yes, and I'll take the dog with me," said Alice, running to her mother.

The dog followed her, and seeing that Mrs. Wilson was not going to hurt his little friend, he seemed very much pleased.

"May I take the doggy, Mamma?"

"I guess not, dear; I don't think Aunt Mary will want dogs in her house."

"I'll tell him to stay out-doors. He will mind what I say, won't you, doggy?"

The dog gave a sneeze, as much as to say yes.

"There! Did you hear him say yes? Can he go, Mamma?"

The dog stood looking up into the face of Mrs. Wilson, as though he knew what they were talking about. Mrs. Wilson wanted to get rid of the dog, but she also wanted to please Alice; so she said, "Yes, if he is here when we get ready."

The dog seemed to know what she said, for he rolled over several times, to show how pleased he was.

"Now, doggy, you lie right down on that mat, and wait for us. Don't you get up, will you?"

The dog sneezed twice, and laid down on the mat and shut one eye, while he kept the other on Alice till she went into the house.

Mrs. Wilson hoped he would become tired of waiting, and was as long as possible getting ready; but when they came out the dog was still there. When he saw they were going, he walked to the edge of the sidewalk, and stepped down into the street.

"I guess he wants me to get on his back; don't you, Mamma?"

"He acts as though he did, but perhaps you had better walk along with me."

"Oh, yes, let me; he will make a splendid horse," and Alice ran and climbed upon his back.

The dog kept perfectly still, and stood looking at Mrs. Wilson. She took hold of Alice's hand, and then the dog stepped up on the sidewalk, and walked quietly along by her side. When they arrived at Aunt Mary's, Alice showed him where to lie down, and he obeyed her at once. Aunt Mary lived near the river, and Alice had always wanted to go down and see the water, but her mother had never let her; so when Aunt Mary asked her mother to go upstairs, to see some new things she had been buying, Alice ran out into the street, and started for the river. The dog started with her, and they had a fine time playing along the road. When Alice's mamma and Aunt Mary came down stairs, they looked out of the window, expecting to see Alice in the yard.

"Where can she have gone?" asked Mrs. Wilson.

"You don't think she could have run down to the river, do you?" asked Aunt Mary. Mrs. Wilson looked that way, and saw Alice standing near the river bank, but the dog was between her and the water. Every time she tried to reach the water the dog would step before her, and keep her from it.

"I must go right down after her," said Mrs. Wilson.

"I should not," said Aunt Mary. "The dog will take care of her. Where did you get such a splendid animal?"

"I never saw it until to-day. I found Alice feeding it out in the yard just before we came here."

"It has taken a great liking to Alice, I should think, and it seems to know how to take care of children. See—it is trying to make her come this way now."

Slowly the dog was driving her away from the river, and Alice soon turned towards the house, and the dog trotted along by her side. When she came into the house, Alice's mamma asked her why she had gone to the river, when she knew she had been told not to.

"You did not tell me not to go to-day."

"No, but you knew I did not want you to go."

"Well, I didn't go very near the water."

"No, because the dog would not let you. He knew you ought not to go, so he stopped you. He is a good dog. Come, we are going home now."

"Can I ride?"

"Yes, if the dog will let you."

"Come, doggy, I want to ride," said Alice, and the dog came up and stood still while Alice's mamma put her on his back.

Soon after they arrived, Alice's papa came home and was very much surprised to see the big dog in the house, and still more so when he heard about the dog's actions. Alice gave the dog a good supper, and Mrs. Wilson made him a bed in the woodhouse.

About a week afterward, a gentleman called at the house and claimed the dog, whose name he said was Gyp. Mrs. Wilson told him how the dog came to them, and the dog seemed glad to see the man, but no amount of coaxing would call him away from Alice. The gentleman told Mrs. Wilson that the dog belonged to his little daughter, who was about the same age as Alice, but who had died three months before. The dog had been very lonesome after she died, and finally had gone away, and he had just heard where he was.

Mrs. Wilson offered to buy the dog, as Alice had become so much attached to it; but the man would not sell it, for he said money would not purchase the faithful animal, but that he would give it to Alice, because he saw the dog had taken the same fancy to her that he always showed for his own little daughter. From this time, Alice and the dog were always together, and Mrs. Wilson never worried about her, for she knew the dog would take good care of her.

One afternoon, when Alice was playing in the street, a runaway horse came suddenly around the corner. She was sitting with her back towards the runaway, and so did not see it. Her mother saw her danger, but was too far away to reach the child before the horse. She expected to see Alice killed before her eyes, when Gyp bounded into the street from the other side of the road, caught Alice by the dress, and sprang into the yard, laying the screaming child at Mrs. Wilson's feet. Alice was terribly frightened, but she was not hurt a bit, and as soon as her mother put her upon the ground again, Gyp began to lick her face and to show how glad he was that she was not hurt.

Do you wonder that Alice thinks so much of her pet? And do you wonder that both her papa and mamma treat the dog as one of the family?

"GYP BOUNDED INTO THE YARD WITH ALICE IN HIS MOUTH."

Ten Dollars for Somebody.

For the best solutions of this month's puzzles we offer three prizes—for the very best, a prize worth five dollars; for the second best, one worth three dollars; and for the third best, one worth two dollars. Solutions must be mailed before January 15th, to "Puzzle Editor of the AMERICAN AGRICULTURIST, 751 Broadway, New York."

8. GEOGRAPHICAL.

Six Massachusetts towns:

1st, a kind of nail; 2d, the crossing of a river.

First, a reproach; second, a word of encouragement.

First, an artist's name; second, to inter.

First, a boy's plaything; second, what we could not live without.

First, what cows do; second, a measure.

First, a marsh; second, a noted American general.

9. BURIED CITIES.

Each of these sentences contains the name of a city:

I sent Sara to gather berries.

I asked, "Where are my jewels?" and Echo answered, "In burglars' pockets."

They were thrown into a panic, or kind of sudden fright.

What good mittens to wear in ice or snow!

Where does her money go? She gives part away to the poor.

10. WORD PUZZLE.

Arrange nine letters in a square so that they will make nine words of three letters each.

11. REBUS.

S., I owe you 10. (One word.)

12. WORD HUNT.

How many pairs of English words can be made from the letters E E H N O S T W? Each answer must contain two words, and each pair of words must contain all the letters given above. (Example: Honest, we.)

13. ANAGRAM.

Tall men's tins. (The answer is one word.)

14. WORD SQUARE.

1, something useful at night; 2, a surface; 3, a repast; 4, white.

15. REVERSION.

Reverse the highest point you know
And find the greatest depth below.

16. WORD DIAMOND.

1, a letter; 2, a city; 3, a game at cards; 4, a body of water; 5, a letter.

17. DROP-LETTER.

—a—a—i—l—c—l (one word).

ANSWERS TO PUZZLES IN JANUARY NUMBER.

1. A river.
2. C-lad, D-ark, B-right, C-art, H-ash.
3. King Cole.
4. Verisimilitude.
5.
M A N Y
A R E A
N E A R
Y A R N
6. Complacently.
7. Band, age.

FROM NEAR AND FAR.

Attractions of Tryon Valley, North Carolina.

Tryon Valley is in the southwestern part of the State, on the border line between North and South Carolina. It is surrounded by the Tryon range of mountains on the north and west, and on the south by the Melrose mountains. It is about 1,400 feet above tide water, and is one of the prettiest valleys in the country. The mountains on either hand are grand and their sides covered from summit to base with fine timber. All kinds of hard wood are interspersed with groves of pine, making, particularly in autumn, a beautiful sight, with various tinted foliage. Bottom lands, through which the Pacolett river flows, are very fertile, and grain and grasses grow to perfection. On the southern side of the Tryon mountains is situated the noted thermal belt. Along this belt and in the valley are grown fine peaches, pears, apricots, plums, and berries of all kinds. I was raised in Delaware, and was for a number of years connected with one of New York city's largest commission houses, and ought to know pretty well what fine fruit should be.

We have very short winters. In fact, one can hardly imagine we have winter at all. I have never seen the ground frozen to the depth of three inches. Cold weather never lasts here more than two or three days, and then not cold enough to form ice over one-half of an inch thick on still water. The atmosphere is very light and dry, and favorable for persons troubled with pulmonary or throat disease. I came here three years ago suffering from hemorrhages and lung trouble; to-day I am comparatively well, and, no doubt, owe it to this bracing and health-giving climate. Land is cheap, and living here is not so expensive as in some of the Western sections, and far better than in Florida or Lower California. Last year the first fruit was shipped from this section to the New York market from four to five weeks earlier than from the Delaware and Maryland peninsula. It brought handsome prices, and the commission men say they never handled finer fruit. Fruit trees have ten months in the twelve to grow and make wood; consequently, they are strong and very hardy, and bear up under their immense weight of fruit. We had last year fine ripe peaches on the table May 25th, and on October 24th we still had peaches just picked from the tree. Vegetables of all kinds grow well. Celery, turnips, and late cabbage do not have to be taken out of the ground. Last December I banked my celery, and it continued to grow, burst through the bank, and was as good as any Kalamazoo celery. We plant our early potatoes about the last of January, and the second week in April of last year I had fine potatoes.

R. F. BELL, Polk Co., N. C.

Celery-Growing Near Chicago.

While vast cabbage gardens are cultivated in the southern limits of Chicago, the land immediately north of it has for many years been largely devoted to celery-growing. The soil best adapted to the celery crop is the low, black, almost peaty, sandy land that lies between the sand hills which border the shores of Lake Michigan. This soil is almost entirely composed of decayed vegetable matter and sand, with water two or three feet below the surface, moist and cool at all times a foot below. Before the Kalamazoo celery fields covered an area of 3,000 or 4,000 acres, Chicago was the truckman's paradise. Not a few of the early truck farmers are now wealthy. The average price through the year was formerly 37½ cents a dozen, at least, while now the grower does well to get 20 cents. It is, however, a fact that home-grown celery is once more in the ascendant, and readily commands ten cents a dozen more than the Michigan article. One of the peculiarities is that this crop is now in season from July onwards, while in old times it was out of season until frost appeared in autumn. Fifteen or twenty thousand plants can be raised on an acre, and two crops on some of the land. This makes a fair showing, even with low prices. Then, again, the peculiarity of this soil renders the handling and earthing-up of the easiest nature. There is no heavy or dry soil that can ever yield celery successfully. Seven years ago the writer made some effort to ascertain the quantity grown in this celery district. There were 200 acres, producing about 5,000,000 plants, as product. It was formerly grown right in the old city limits of Chicago, not a mile from the center, and held its own stubbornly at a yearly rental of $50 to $100 per acre, gradually moving northward up the lake, as the ground was covered with buildings. It may now be found from four to ten miles, but always on the same kind of soil. Thirty years ago, half the best celery grounds were covered with water six months of the year. Moss and aquatic growths and the leaves of trees, with sand mixed from the sand dunes, formed the basis of the soil now so valuable for the celery-grower.

EDGAR SANDERS, Cook Co., Ill.

Sheep Husbandry in the South.

Can sheep husbandry be carried on profitably south of Mason and Dixon's line? Yes, decidedly, if properly managed. Of course, the South is large and the land diversified. Even in Virginia, if one should drive for a few days at some distance off the railroad, he will find a variety of land. Large fields will be found growing up to pine trees, mixed with dogwood and sassafras, or persimmon. Such places, in connection with the old fields growing up to broomgrass, mayweed, stickweed and briars, are the home of the sheep. In other parts will be found bottom lands, along the numerous branches and creeks. Those fields do not suit sheep at all, except in extraordinarily dry years. Sheep thrive well on those large fields where two or three hundred acres are growing up in broomstraw and small pines. As to herding them or inclosing lots to keep them in large pastures, all depends on the locality and on the amount of capital invested. I have kept sheep in pastures and they paid very well. Many of my neighbors kept them the same way, with satisfactory results. On the other hand, my brother kept sheep with a shepherd and dogs, and that system suited very well in his locality. Most of our labor or hired help in the South is colored, and whatever the virtues of the old plantation negroes may be, I doubt very much whether they possess those golden qualities which ought to be found in a reliable shepherd. Therefore, unless the capital invested is sufficient to carry on the business on a large scale, and to keep a trained shepherd, the best way is to inclose fields with either straight wooden or barb-wire fences. The zigzag fence is too often consumed by fire. Will it pay? Of course it will! Why not here as well as in all those countries where the soil is a good deal poorer than here and the climate not as favorable? Look at the provinces of Utrecht and Drenthe, in my native country, the Netherlands. There in some sections the land was next to worthless, but by sheep husbandry in combination with improved agriculture those provinces were built up and became prosperous. Why can't this be done in America just as well? Especially here in the South, where land is cheap and plentiful. I will only add that sheep-keeping has always encouraged other industries. The tobacco-growers in the Netherlands raise sheep for their fertilizing qualities, and if they spend in a winter a thousand dollars for linseed cake, etc., they get doubly repaid, first in mutton and then in abundant crops of tobacco. Flax and beet-roots, great sources of wealth, could not exist without the assistance of sheep. However, two things are necessary to make it successful, and those are, proper knowledge and capital.

WM. STAPELKAMP, Amelia Co., Va.

Climate of Montana.

Montana is a large State, containing over 145,000 square miles. Most of the western and southwestern portions are greatly broken and diversified by the main range of the Rocky Mountains, with its numerous spurs and isolated groups of smaller ranges. The northern, southeastern, and central eastern portions are for the most part open, rolling plains—not prairies like those of Dakota, but high plains and table-lands, interspersed with valleys and streams in every direction. As one would naturally expect from such physical variation there is also a proportionate variation in the climate. Roughly speaking, the northern, eastern, and central eastern parts are well supplied with rain, which descends most abundantly in June. Summer begins early in June and lasts practically until the end of October or even the middle of November, for the autumn weather is like that of summer except that the nights are usually frosty. The heat of summer is not greater on an average than in "the States," and it is felt far less than there on account of the soft breeze that blows almost constantly from the Pacific ocean. One has only to seek a spot away from the direct rays of the sun in order to be cool and comfortable. This point, it must be remembered, is of great importance to the grower of any class of stock. Montana winters as a rule are not to be feared. Snowstorms occur, severe ones too, but a "blizzard" is wholly unknown. Sometimes it snows steadily four or five days and nights; but when it does the temperature is almost invariably from ten to twenty degrees above zero, and little or no wind is stirring. The storm over, bright, clear weather follows, and "nary a cloud in sight" for two or three weeks. When the thermometer registers twenty degrees below zero, or when it goes still lower, which occasionally happens, not a breath of wind is ever blowing; the sky is as blue and the sun as bright as in midsummer. We only know how cold it is by looking at the thermometer. A dry, cold atmosphere is pleasant and invigorating if one is properly protected and has a good circulation. Climate, be it remembered, affects the lower animals, especially domestic stock, even more than it does man. Fortunately, for stock as well as for travel, the snow lies continuously on the ground, as a rule, only from a month to six weeks. The reason of this is that we are influenced by the inland breeze from the Japan current in winter as well as in summer. In winter time this wind is popularly called the "Chinook." In summer it is cooler than the general atmosphere and in winter it is warmer, so that at that season its presence is more fully realized, and its moderating effect upon the severity of the cold is apparent—sometimes in a most marked degree. I have seen the country covered by snow nearly two feet deep, when a "Chinook" would melt all that snow and lay bare the grass in from six to eight hours. This curious phenomenon is probably repeated a dozen times or more in the course of a winter, so that the grass is kept bare and within reach of range stock most of the time. On the ranges or rolling plains the native grasses, which are nearly all perennial and form a more or less dense turf, send up leaves and culms from their base or "sod" every spring, and as summer goes on the seed is formed and ripened. The plants have then practically fulfilled their mission for that season. Every leaf and stem is fully developed and mature; so the sun dries them up just as they stand, making them into a perfect hay, full of the nutritive elements of the plants. It is on this naturally-produced hay that horses and cattle as well as sheep fatten in the fall of the year. That they fatten so readily on this diet is proof enough of its nutritious nature.

F. W. ANDERSON, Cascade Co., Montana.

The Outlook in Florida.

For the first time since the big freeze in January, 1886, the outlook is very hopeful and encouraging for Florida. The freeze proved to be a comparatively insignificant and harmless affair, but a few cases of yellow fever in different parts of the State in 1887 and 1888 caused great damage from the scare, though the mortality was very slight. The past year, however, there was not a case in the State, which proves that it is not indigenous, and confidence is rapidly increasing. Besides, the orange crop is a good one, and is bringing good prices, the majority of the growers having combined to sell their fruit at home for cash, or ship through the Exchange, and thus be no longer at the mercy of commission men.

The growing of tobacco, grapes, strawberries, and a variety of small fruits is proving profitable and encouraging, while market gardening is year by year assuming increased proportions. In short, people are learning how to grow and market profitable crops. Another important fact is that more and more of the natural resources of Florida are being discovered and developed. Among the more prominent are lime, gypsum, phosphatic rock, Spanish moss, palmetto fiber, etc. In South Florida, pineapples and guavas are largely cultivated, while the Peen-To, and several other Asiatic varieties of peaches, are proving successful throughout the State. The prices of lands have gone very low, and the discouragements of the past three years have compelled the residents to diversify their products. The people are working together as never before, through Fruit-Growers' Unions, the Farmers' Alliance, the Fruit Exchange, etc. People are beginning to understand that the inducements to new settlers are not the hope of speedy fortunes, but the advantages of homes in a delicious climate, where, with

proper enterprise, they can pluck fresh fruits and vegetables every week in the year, and enjoy an abundance of sunshine.

The orange crop of the State will be about two million boxes, about the same as last year. The severe drought in the spring greatly reduced the yield in many localities. There was, also, a lack of rain in October and November, which was discouraging to the growers of strawberries and vegetables. Droughts are very common in spring and fall, and no cultivator of the soil can be reasonably sure of success without irrigation. With it, and a moderate amount of fertilizer, almost anything can be grown, at any season, though some will need shading from the hot sun of summer, or from the occasional frosts of December and January. Nothing heavier than thin cotton cloth, however, is required.

SHERMAN ADAMS, Orange Co., Fla.

Life in North-Germany.

Herewith I send a photograph of my father's house, on the shore of the Baltic. The house stands only two hundred yards from the sea, and nineteen feet above high-water mark. It is more than a hundred years old, and was used as a farm-house until it became the property of my father, about thirty years ago. It is now a summer resort, as is indicated by the pavilion and bathing-carts. The walls are about twelve inches thick, of brick. The roof is thatched with straw to the thickness of eight or ten inches. Such a roof is warm in winter, cool in summer, turns rain perfectly, and will last for twenty years. The general type of farm-houses here are built two stories high, with the living apartments for the family in one end. In the other end are the stalls for the domestic animals, with the loft for hay and straw above them. The German farmer likes to have his stock as warmly sheltered as he is himself. He is equally careful to see that they are well and regularly fed. About the 1st of November the milch cows are put in the stable, each one being secured by a short chain. Every day, about seven o'clock, they are given a feed of hay and straw, finely chopped, dampened, and mixed with bran and chopped beet-roots. About nine o'clock they are watered, and given a feed of long hay, wheat- or rye-straw. The cows lie down and chew their cuds from eleven until two o'clock, when they are again fed, as in the morning. About five o'clock in the evening the cows are milked by the girls, watered, fed, and left to their night's repose. The stalls and all parts of the stable are kept scrupulously clean; the cows are treated with great care and gentleness, and protected from excessive heat in summer, and from the cold rains of spring and fall.

HUGO C. KNOOP, Pomerania, Germany.

SUMMER RESORT ON THE BALTIC SEA.

The Colored Exodus and Its Effects.

A great deal has been published in the newspapers about the exodus of the negroes from North Carolina. In many instances the proportions of this movement have been exaggerated, but the number that has gone is very considerable, and a repetition of it is promised for next fall. This loss of labor has, of course, interfered seriously with the large farmers, but it has not worked any very great hardship, because North Carolina has more small farms—that is, farms on which the occupants, white or black, themselves do the farm-work—than any other Southern State. In the long run, it will be a good thing for the State. Those negroes who own land—and they are by far the best—are not going. A large quantity of land is open to settlement at very cheap prices. An opportunity is thus given the small farmers in the Northern, New England and Northwestern States to buy really good lands in North Carolina at very low prices. The number of independent landholders will be greatly increased, and the already conservative character of our population will be improved by the addition.

P. M. WILSON, Wake Co., N. C.

New Brunswick Farming.

The Indians called the Bay of Chaleur the Bay of Fish, and it still swarms with finny multitudes, in spite of the white man's reckless greed. There is an abundant food supply always within reach. But this advantage is largely neutralized by the fact that nobody cares for fish or uses it except by way of variety or necessity. The farmers look to the sea rather as a source of fertilizers than of food. Every storm drives up the sea-weed. Every spring brings its countless shoals of herring. The owner of less than one hundred acres told me that he had used this year two hundred barrels of herring on his land.

In regard to the value of the sea-weed there is entire agreement; but the most careful farmers think that the fish injure the land, forcing a crop, but leaving the soil exhausted.

The amazing prodigality of Nature, and the still more amazing wastefulness of man, are shown in the fact that over five hundred barrels of herring spawn were carted away from a single beach this season. And yet the people wonder that the schools of mackerel have deserted them, and that the codfish are smaller year by year.

Careful culture makes clean fields here as everywhere, but there is a noticeable absence of many of the weeds which are troublesome and persistent in the States. Half the catalogue of rank growth from any neglected New York farm would be absent here. The Canada thistle is the most troublesome of all, but it does not show the vigor which it displays in the Northern States. Even the ox-eye daisy seems modest here, and ragweed is not seen anywhere. The potato fields are bright in summer with universal blossom, and the Colorado beetle is as little known as the can of Paris-green.

Primitive methods go hand in hand with modern machinery. One of the boys asked, with an air of superior knowledge, whether we had ever seen a self-binder. We did not tell him of the gray-haired woman whom we had seen on the French side of the bay, reaping barley with a sickle, and binding it bundle by bundle; but went with him to see the new machine, made in Ontario. Hay is drawn to the barn by one ox, between the shafts of a two-wheeled cart.

The women take a very large share of the hard out-door work. The garden and potato-patch are theirs from the time the snow melts in one and the plough leaves the other. They milk, make butter and cheese, spin, weave, wash, cook, and work in the hay- and grain-fields. They tend, if they do not catch, the codfish. It seemed unkind to let the daughter of the house dig potatoes for an hour together; but it must be said that the investment of labor out-of-doors seems to pay large dividends in health.

The man of the house, for his part, takes care of the stock, is salmon-fisher in spring, head-farmer in summer, and lumberman in winter. He seldom touches the codfishing, but coins ready money from his salmon-nets, and from the sale of cedar (arbor vitæ) railroad-ties, at $12 a hundred. On this farm, of about 116 acres, from forty to sixty sheep are kept, eight cows, three horses, and several swine.

On the whole, the life has many attractions. The (Scotch) people are a kindly, hospitable, and independent people. The summer climate is delightful. There are many emigrants among the younger men; but, on the whole, I do not wonder that one of our neighbors left large pay in Minnesota to return and settle here upon a hundred acres, between the codfish and the balsam woods.

ISAAC OGDEN RANKIN, Restigouche Co., N. B.

A Phenomenal Winter in California.

California seems to be almost without a winter of any sort this year. So far, the season presents some features that are hardly paralleled in the horticultural history of the State, since the first Americans began to plant trees and vines in the early fifties. Many parts of the State suffered from drought last year. Last summer the heat was unusual in the interior valleys, and the forest fires in the mountains were gigantic. The early winter rains came at the beginning of October, and were so heavy as to spoil hundreds of acres of beans in the coast counties, and hundreds of tons of grapes in the fruit-growing districts. The rains, in other words, came down a month earlier than usual. It is only once in twelve or fifteen years that October rains occur in California; November is the rule, and the "early rains" often do not come until December. Last year from eight to twelve inches of rain fell in the coast counties, and, all over California, the grass began to grow; the farmers began to plow and sow during the latter part of October. Besides this, there were fewer frosts than usual, warmer days, and no violent winds. On the first of December, such a growing season, such a semi-tropical winter, as we had, was never put on record on the Pacific coast before. The best illustration of all this that I can find is perhaps in the condition of the fields, pastures, and orchards. The grass on the roadsides and on the hills was at that date as tall, thick and strong as it usually is seen three months later. The wheat sown since the rains was up and beginning to cover the fields. The buds of many of the deciduous fruit trees in the orchard were swelling, and almost ready to burst, while, as yet, the leaves had not fallen. There was no autumn, and seemingly no winter. The spring followed the summer without a break. The apricot, plum, and cherry orchards presented the curiously-mingled aspect of a few yellow leaves mixed with dark green ones, yet fresh as in summer. Men were pruning in large orchards where, as yet, few leaves had fallen from the trees,—and this in December!

The blackberry, raspberry, and strawberry vines were full of blossoms and green and ripe berries. New potatoes were in the markets, while the late pears and apples were hardly all gathered, and the quinces and Japanese persimmons yet hung in the tops of the trees. It was a year of contrasts in every field of outdoor interest.

CHARLES H. SHINN, Alameda Co., Cal.

A Vote of Thanks.—I am very thankful for all the valuable reading and the many splendid illustrations the AMERICAN AGRICULTURIST has furnished me all these years for such a trifling compensation as its subscription price. I find the magazine constantly improving, and like it more and more; otherwise, I would not, as I now have done, taken the pains to collect and bind over eighty numbers, and a complete and extensive list of the articles as well as smaller items contained in them.

ERNST SKARSTEDT, Vancouver, Washington.

FARMING IN FOREIGN LANDS.

The production and consumption of milk in France amounts yearly to 1,350,000,000 gallons, which is three times in excess of the production of wine.

The consumption of tobacco in England has nearly doubled in the last forty years, amounting at present to nearly a pound and a half per head of the population.

For many years India has been growing tobacco only for domestic use, but now an effort is being made to induce its cultivation on a large scale for commercial purposes.

American cattle have been shipped in such large numbers to Liverpool of late that many of them are delayed landing on their arrival because of insufficient accommodation.

New South Wales is troubled with an over-supply of mutton, there being now about 50,000,000 sheep in this colony, of which 23,000,000 are ewes. Breeders are hoping for a revival of the frozen-meat trade, which collapsed a year or two ago.

At the Newcastle-on-Tyne police court recently two men were arraigned for shipping to Antwerp two cars loaded with horses in a shocking condition. The best of these horses were to be made into "beef" and the second-class into "sausage."

Prof. Le Comte, of Chardonnet, France, has succeeded in producing artificial silk, which, in strength, beauty, and usefulness can scarcely be distinguished by the most expert handlers of this material from the manufactures of the silk-worm product.

Auction marts, in which the farmers sell their own produce direct to the consumers, have now almost entirely displaced the open markets in England. The latest venture of this kind is at Sterling, where the farmers, in addition to establishing a mart of their own, intend to have their cattle sold by live weight only.

Immense quantities of currants and Turkish and Spanish raisins are annually imported into France for the manufacture of wine. This importation has now increased to between 40,000 and 50,000 tons of currants, and 60,000 tons of raisins. The wine thus produced is largely used by the poorer classes in France, Germany, and Switzerland.

Burmah is capable of more than making up the greatest possible deficiency in the world's supplies of kerosene oil. The oil-bearing strata of Upper Burmah covers an area of probably one hundred square miles. At twenty-five per cent of Dr. Fritz Noetling's estimate, the quantity annually produced would be about 1,184,000,000 gallons, which would still be greatly in excess of the highest rate of production ever obtained in America, 912,000,000 gallons, in 1882.

A leaf disease has broken out in a virulent form on the coffee plantations in Southern India, and the hitherto most successful and sanguine planters are beginning to lose heart. Some plantations are completely riddled with this disease. The destroying process takes place very rapidly, reducing the yield from one-third to three-fourths. Some growers are making nurseries of shade-trees on their estates, as shade seems to be the only remedy for the disease.

Considerable damage has been done of late to the cocoanut trees in the Straits Settlements, in India, by the red beetle and the rhinoceros or elephant beetle. A bill has been introduced into the local Council to combat this evil by protecting trees not already attacked by these pests, and imposing a fine, not exceeding five dollars, on any person who refuses to destroy the trees thus attacked. The Government will compensate poor persons for the loss of their property, at the rate of five dollars for each tree.

One of the lessons taught by the recent Royal Agricultural Society at Windsor was, that while few actual novelties in agricultural machinery are now being invented, there is a strong tendency toward larger portable engines, higher steam-pressure, and a more general adoption of the compound system of working, which has proved so economical of fuel in steamships. Owing to the depletion of capital in British agriculture, however, British engineers in this branch of trade must depend on the foreign demand for probably some time to come.

The New Zealand Agricultural Company, an English corporation, that carries on extensive operations near Dunedin, has nearly 100,000 sheep, and makes a specialty of mutton for export, though the 65,000 sheep sheared averaged six and a quarter pounds of wool. The average price of mutton sheep in Dunedin market, for the year ended June 30, 1889, was $3.15 per head, against $2.70, as the average for the previous year. This improvement is in sympathy with the general advance in all sorts of produce, and is not due to higher prices for frozen mutton in London.

The second international show of the Argentine Rural Society will be held at Buenos Ayres, April 20 to May 11 inclusive. Foreign entries closed January 1 and are quite numerous. All kinds of horses, beef, and milk-breeds of cattle, swine, and sheep will be shown. Prizes will be awarded to the live fat animals, but a report on each carcass will also be made under the veterinary staff jurisdiction. A jury will be appointed to supervise all exhibits, one of whose duties will be to reject all machinery and instruments known previously to 1886. This last is a rule, new to American shows, that indicates the progressive spirit of our Southern agriculturists.

A great spur to Indian agricultural education is the recent decision of the Senate of the University of Bombay to institute a diploma in agriculture. The debate that settled this much-mooted question was one of the most remarkable in the history of the University. The principal member of the opposition expressed the opinion that such a proposal was abhorrent to the very name University, and sarcastically suggested that if it bestowed a diploma in agriculture it might as well in cooking, tailoring, etc. But the friends of agriculture had only to cite what other countries, and especially America, were doing for agricultural education to carry the day.

The Victorian government has secured the services of Mr. C. H. French, an experienced entomologist, to devise means for the eradication of insect pests, whose ravages form a serious drawback to the fruit-industry of the colony. One of the principal incentives for this act is the desire on the part of the government to share in the enormous import trade of fruit into England, which now has reached the value of nearly $30,000,000. At a recent conference of fruit-growers, attended by delegates from all the principal fruit-growing districts, a resolution was passed to form a Board of Horticulture similar to the California Horticultural Board.

Prof. M'Fadyean, of the Royal College, Edinburg, in a recent number of the *Journal of Comparative Pathology*, criticises the old theory that tetanus or lockjaw is an equine disease, and that from horses the specific microbes find their way into the soil, and thence occasionally infect human subjects. Prof. M'Fadyean's idea is that the organism lives and thrives in the soil, and thence finds its way into the bodies alike of men and horses,—a statement he believes to be confirmed by the fact that, in a large proportion of equine cases, this disease affects the feet, and also by the fact that of two hundred and fifty cases of tetanus in human patients investigated, seventy-five occurred in farmers and agricultural laborers, and only four in horse-dealers.

The Wolseley sheep-shearing machine has been worked with wonderful success at Mildura, Australia, the past season. About 20,000 sheep have been operated upon, and it is estimated that one hundred sheep a day is a fair average performance for this machine. The machines are run, a dozen at a time, by an endless cable driven by a McLaren traction engine. By this process the wool is taken very cleanly and evenly from the animal and without injury. On the Mildura plantations, the shearing, sorting, and baling up are going on simultaneously, and the wool is classed in first, second, and third combings, No. 1 pieces ("bellies") and scraps. These are baled in an ordinary dumping press, large enough to compress from three to four hundred weight in a bale of about one cubic yard.

Italy has at last an emigration law. Under its statutes emigration is practically free, but "no one can collect emigrants, sell or distribute tickets for emigration, or become the broker thereof, with the view of gain therefrom, procure or assist their embarkation, unless he shall have procured a commission from government authorities." The emigrant is not bound to pay the agents or sub-agents for any service whatever, and the latter cannot collect emigrants outside the district in which they are authorized to act; neither can they travel through the country publicly inciting or soliciting citizens to emigrate, under penalty of imprisonment and fine. The law is an admirable one in every respect, and is just what is needed in these days when so much fraud is perpetrated by contractors for foreign help to induce emigration.

Marvelous prosperity has come to the State of Yucatan, Mexico, within the last five years, from the production of hemp fiber. The plants begin to yield three or four years from planting, and give about 2,700 pounds of fiber per acre annually. The average price received for the fiber last year in Yucatan was nine cents per pound, so that the receipts per acre were $243. The cost of production and delivery in the local markets is two cents per pound, making the net profit to the planter $200 per acre. Sisal hemp also thrives in the Bahamas, and efforts are being made to encourage its culture there. An import duty of 20 per cent ad valorem has been imposed, and a bounty of one cent per pound on all fiber raised in and exported from the Bahamas during the next six years. This is believed by Consul McLain to afford an exceptional opportunity for money-making.

A typical farm in New South Wales is that owned by Mr. John Douglas, which is better known as the Waihao Downs estate. It consists of 10,000 acres of choice agricultural land, of a fine, rich limestone soil, which yields magnificent crops of wheat, oats, and barley, and grows turnips and grass to perfection. Twenty-one teams of horses, or, in all, 120 horses of all kinds and 70 men, are continually employed by the estate. As the men employed have often to work at considerable distances from the homestead, a system of movable camps has been devised, including a kitchen on wheels, provided with a cook and requisites, which accompanies each gang of men. Lying southward of Waihao Downs is the Elephant Hill estate, comprising 22,000 acres of good sheep country and 3,000 acres of cultivated land, which is owned by Mr. H. R. Parker, of England. The sheep on this estate at shearing-time number about 20,000, and a good trade is also done in frozen mutton.

The demand for China teas is constantly growing less. In 1885 China supplied ninety-seven per cent of the English consumption, and India only three per cent; in 1887 India contributed as much as China. This is not considered due to the decrease in culture, or to taxation. The inspector-general suggests one reason for this change in the fact that the Russian trade has been drawn away from London and now goes direct from Hankow and Tien-Tsin to Russia. But there is also a great depreciation in the quality of China teas, the result of bad management through reckless picking and ignorant treatment afterward, and this is undoubtedly the principal reason for the falling off of the trade. The most practical remedy yet offered for this bad management on the part of growers is the establishment of a model tea-farm. China tea is pronounced by the best authorities to be less harmful than Indian, and to possess a much more excellent flavor, and, with the exercise of care on the part of planters, there is no reason why the China tea-trade cannot regain its former prestige.

Some very interesting and careful experiments have just been completed under government sanction in Queensland by Pasteur's representatives (Messrs. Germont and Loir) to enable stock-owners to obtain virus with which to inoculate their cattle against pleuro-pneumonia. These experimenters find that sufficient virus can be obtained by inoculation under the skin to inoculate many cattle in the tail, but that the virus collected in the height of the fever is more active than that collected from an animal apparently on the road to recovery. The subcutaneous liquid, when it has been inoculated in the tail, protects the animals so operated upon against a second attack of the disease as effectively as the natural virus collected from the lung or from the pleura. The virus is effectively preserved, at whatever temperature, for a period of seventeen days. A cultivated virus can be produced which will give the desired result, although the isolation and cultivation of the microbe of pleuro-pneumonia was not actually demonstrated. The Queensland cattle commission is so elated over these successful experiments that it suggests the placing of a supply of pure virus at all times at the disposal of the cattle-owners, and that a department for this purpose, with a competent person at its head, would be self-supporting.

The Law of Barb-Wire Fence.

Barb-wire fencing has been in use since 1876. Its widely-known distinctive principle is the sharp prick of the barb or spur, to repel the trespassing beast by an instant sense of pain. In an age like our own, honorably distinguished for humanity to the brute creation, the new fence material was at once challenged as a form of inhumanity to be put under the ban of law. Enough time has elapsed for a test of the question, and we have taken pains to inquire into the legality of barb-wire fencing in the several States, many of which, since 1880, have taken legislative action on the subject.

We confine the inquiry to farm-fences, since in suburbs and village communities other conditions exist, and various restrictive local ordinances make the rule. It is worth noting in advance that no recognition has been given in any of the statutes to the varieties of barb-wire. All seem to have been put on an equality, leaving to consumers the selection of the form of material, whether plain, simply notched or serrated, or sharply barbed. Buyers may find nearly a score of kinds of barb-wire.

To characterize in preface the review of State legislation which follows, there is no State where barb-wire has not, either by custom or express definition, become a legal fence. In most of the States, from the first, as in some of them at the present time, barb-wire has been adopted among permitted "other fence material," or "such as good husbandmen ought to keep," or whatever the statutory phrase may be, allowing a choice. There is no State or Territory where barb-wire is prohibited.

The earliest form of barb-wire legislation, notably in some of the Western States where such restriction seemed early necessary, came in the nature of heedful enforced use of a material which might be easily and carelessly resorted to as a barrier, and yet might be unsatisfactory to adjoining owners in the case of division fences. We give in their place some of these earliest statutes.

Since fences in some form, either for fencing in the cattle or fencing them out, must exist, the enactments of our State legislatures are sufficiently heedful. Recent statutes and amendments, up to those of the present year, seem to show that there is nothing antiquated in "fence prudentials," to which we now briefly invite attention:

Maine. Amendment of 1883. "No barb-wire fence built since April 15th, 1883, shall be accounted sufficient unless it is protected by an upper rail of board or wood."

New Hampshire. Prohibits the use of barb-wire as a partition fence adjoining lands occupied for school purposes.

Vermont. Among permitted fence materials.

Massachusetts. Use prohibited within six feet of the ground along highways where sidewalks are maintained.

Rhode Island. In use according to provisions of general law.

Connecticut. Amendment of general fence law in 1886 constitutes barb-wire a legal fence, to consist of four strands, the upper strand four feet from the ground (Sec. 2,273). "No barb-wire to be used within five feet of the ground along any sidewalk, or any public highway," without consent of authorities (Sec. 2,274). Amendment of 1889. Use of barb-wire prohibited within twenty-five rods of house or barn of any adjoining proprietor without his consent.

New York. There is no general fence law except for railroads, in which wire is a permitted material. Every town regulates its own fence matters.

New Jersey. By Act of 1883 the height of the lawful fence is fixed at four feet two inches for post and rails, timber, boards, brick or stone walls; all other fences four feet six inches high.

Pennsylvania. In use under general provisions of law.

Delaware. In use under provisions of law for counties.

Maryland. Special fence laws for counties. No prohibition.

Virginia. Local fence option in the counties. No prohibition.

North Carolina. Local fence option by counties under "No Fence Act." No prohibition.

South Carolina. Local fence option. In an act passed 1885 barb-wire is expressly enumerated among materials permitted.

Georgia. Law of 1883 prescribes construction of barb-wire fences, six strands "tightly stretched." Posts not over ten feet apart. A plank not less than ten inches wide may be used in place of the two lower strands.

Alabama. Barb-wire in use under general law.

Florida. Law of 1885 provides for barb-wire fences not less than five feet high, posts not more than twenty feet apart, "with a plank, rail, or metal or wood tablets at the top of the fence."

Louisiana. Barb-wire is in use under the general laws of parishes.

Texas. The legal fence is "three strands of barb-wire with posts not more than fifteen feet apart, with a board not less than four inches wide and one-half an inch thick, hung to the top wire, or two strands of barb-wire and a board or rail," etc.

Arkansas. In use under provisions of general fence law.

Missouri. Act of 1887. Legal fence three barb-wires, the upper one four feet from the ground; posts sixteen feet apart.

Kentucky. In use under provisions of general fence law.

Tennessee. In use under provisions of general fence law.

West Virginia. Act of 1883, amending Act of 1882, prescribes not less than five strands, blocks two inches square to be placed not more than two feet apart upon the fourth strand, or in place of the fourth wire a board or plank may be used.

Ohio. Under general fence law.

Indiana. Under general fence law.

Illinois. By amendment of 1887 (Sec. 2, ch. 57), barb-wire is enumerated among lawful fence materials.

Michigan. The general railroad law of 1887, amending acts of 1885 and 1883, provides for a combination fence of barb-wire and boards; also for a six-strand, barb-wire fence with a six-inch board at the top.

Wisconsin. (Law of 1878.) "A barb-wire fence consisting of two barb-wires with at least forty barbs to the rod, and one smooth wire firmly fastened to posts not more than two rods apart, with one good stay between them, the top wire not over fifty-two nor less than forty-eight inches from the ground," etc.

Minnesota. Act of 1877, from which the foregoing seems to have been copied.

Iowa. (The earliest statute.) Law of 1876 amends general fence law, and defines a barb-wire fence to "consist of three barbed-wire, or four wires, two of which shall be barbed, such fence in either case to have not less than forty barbs to the rod," etc.

Kansas. Wire is accepted as a fence material without other designation.

Nebraska. Wire an accepted fence material.

Colorado. Wire an accepted fence material.

California. Wire an accepted fence material.

New Mexico. Under general rule of fences by counties.

Utah. In use under general law.

Idaho. Statute of 1887 provides that a barb-wire fence shall consist of not less than two barb or three plain wires, with a board or rail at top of all.

Montana. Under general fence laws.

Nevada. Under general fence laws.

Washington. Statute of 1888 elaborately prescribes for the erection of barb-wire fence of three strands in height, kept "tightly stretched."

Wyoming. Statute of 1888 elaborately describes the lawful barb-wire fence, three barb-wires or two barb-wires with pole on the top.

Dakota. Under general fence law.

Oregon. Under general fence law.

New Publications.

CONVENIENT HOUSES, with Fifty Plans for the Housekeeper, Architect, and Housewife. By Louis H. Gibson. Thomas Y. Crowell & Co., New York.

Innumerable books on house-building have been written for the convenience of architects and builders, but this elegant volume of 321 pages differs from all similar works that have come to our notice, in that it is principally devoted to the convenience of the housewife. The author keenly realizes that whatever the architectural beauties and artistic appointments of a home may be, if it be lacking in the proper conveniences and arrangements for carrying on the housekeeping with as little unnecessary labor and loss of time as circumstances permit, it is a failure. Convenience and comfort are not necessarily antagonistic to artistic and beautiful surroundings. How harmoniously they can be blended the author shows at every step. He invites the reader to a journey through the house, and in the successive chapters of the work points out to him every imaginable labor-saving device and convenience of construction entering into the minutest details of every apartment, from the cellar to the attic. No one who follows the author closely through this journey can fail to become convinced that beauty, convenience, and harmony in a house are more a matter of intelligent thought and refinement than of money. Twelve chapters are devoted to descriptions and numerous illustrations of plans and perspective views of homes suited to all tastes and purses. Practical house-building, and the business points of building, are minutely described in all the various details. The closing chapters on "How to secure a home by monthly installments" give a remarkably clear explanation of the workings and methods of building associations, and their advantages to the borrower as well as the investor. To those of small incomes desirous of building a home for their families, the information contained in these last chapters alone is worth the price of the whole work. Sold by the Orange Judd Co. Price, $2.50.

LANGSTROTH ON THE HIVE AND HONEY-BEE. Revised, enlarged and completed by Charles Dadant & Son, Hamilton, Ill. C. Dadant & Son, 1889. Pp. 540.

The publication of the original edition of this work, which appeared in 1852, marked an epoch in American bee-keeping. In fact, the teachings of the book, together with the invention of the movable frame hive by its author, made the modern system of apiculture possible. Several subsequent editions have been published from time to time, with little if any change. Meantime, the science and art of bee-keeping have advanced rapidly, and a new edition was called for which should embody all the latest ideas and improved methods. The task of revision was too heavy for the venerable author, who is bending under the burden of years and ill-health. It was, therefore, placed in hands fully competent and worthy. The revisers, while preserving the main features of the original edition, have added twice as much more, bringing the work down to the present time. It is not only a complete practical manual of bee-keeping, but a book of absorbing interest for all who love nature. Sold by the Orange Judd Co. Price $2.

CAMPING OUT IN CALIFORNIA. By Mrs. J. B. Rideout, author of "Six Years on the Border," etc. San Francisco: R. R. Patterson. Pp. 237, 16mo.

This is a delightful little book. It gives, in bright, vivacious style, a series of word-pictures of the big trees, mountains and seashore of the Pacific wonderland. Sold by the Orange Judd Co. Price 85 cents.

BRIEF COMMENT.

Friesian Herdbook, Vol. XV, for 1889, of this serial contains the pedigrees of black-and-white bulls, from No. 1118 to No. 1250, and of the same class of cows from No. 5173 to No. 5700. In style and arrangement, it is uniform with previous volumes of the series. Mr. D. Van Konijnenburg, Leuwarden, Holland, is the secretary of the Managing Board, under whose control the herdbook is issued.

Horses, Cattle, Sheep and Swine, is a descriptive treatise on breeds, with hints on selection, care, and management, illustrated. One of the most valuable parts of this book are the contributions from various breeders and successful cattle-men as to their methods. It is fully illustrated, and is peculiarly adapted to the Southern States. It is published by the author, Prof. George W. Curtis, of the Texas Agricultural College. New York: Orange Judd Co.; pp. 270; price, $2.50.

Transactions of the Wisconsin Horticultural Society. Vol. XIX comprises the annual Report for 1889, being proceedings of the State society and reports from county societies. Through the "cheap economy" of the Legislature the report was cut down, from the 300 pages which were originally prepared, to 240. But the re-writing and abridgement were performed in a manner highly creditable to the secretary, B. S. Hoxie, and the document is got up in extremely neat style.

Society of American Florists.—Proceedings of the Fifth Annual Convention of the Society of American Florists, held at Buffalo, N. Y. This pamphlet of 153 pages is replete with interest for the professional florist, as well as for every man and woman who loves flowers. The essays published and the discussions reported in its pages are more than usually thoughtful and interesting. This society is eminently rational in its character and objects. Young as it is, it has already accomplished excellent practical results, not only in a business view, but also in the general improvement and elevation of floriculture, and the education and refinement of taste in floral arrangements and designs. This report is furnished free to the members of the society, and may be obtained from the secretary, Mr. William J. Stewart, Boston, Mass.

OUR BASKET

English Walnuts.—J. Peters, Orange Co., N. Y.: We certainly do not know of any good reason why the English walnut, as it is called, should not be as extensively cultivated in this country as anywhere in Europe. There are many very old and very large trees of this nut now growing about New York, and they bear abundantly. But the great bulk of the English walnuts that come to our markets are from Southern Europe, and the seedling trees raised therefrom are likely to be too tender for our Northern States, but succeed well in the latitude of Washington, and further south. But if you will get nuts from our old and thoroughly acclimated trees, the great majority of the seedlings raised therefrom will prove quite hardy, even in Orange county, and perhaps further north.

Take Care of the Tools.—Stanton Hitchcock, Orleans Co., Vermont writes: Winter is the time to repair broken tools, instead of leaving it to be done in the hurry of spring work. Broken tools may be seen lying beside the road, which could be rendered available at slight cost. Plows, harrows, crowbars and other tools are often left in the field where used last, and in the spring the farmer will be inquiring for them and exclaiming that some neighbor has stolen them. He afterward finds them where he had left them. It pays to take good care of tools, repair them when necessary, and house them when they are not in use.

Shoeing Horses.—Joseph Swift, Madison Co., Ohio.: If the movable calks are designed to save re-setting the shoe, have nothing to do with them. Horse-shoes should never be worn more than three or four weeks without re-setting. The hoof is constantly growing, like your own finger- and toe-nails. If the shoe is allowed to remain on too long the foot grows out of shape. As a general thing, the lighter the shoe the better, provided it is heavy enough for the work required. A great, ponderous, two-pound shoe, with taps into which calks are to be screwed, with a view of leaving the shoe on the foot for months, is unfit for any horse.

Asparagus Beetles.—S. Archer, Norfolk Co., Va.: There are two very distinct species of asparagus beetles. Both are natives of Europe, and they were described and named by Linnæus more than a hundred years ago. The first to appear in this country was the *Crioceris asparagi*, this having been found on Long Island about thirty years ago, from whence it has been very widely distributed. Quite recently the other species, viz., *Crioceris duodecim-punctata*, has been found feeding on asparagus in a few places in Maryland. The "twelve-spotted" species is a larger insect than the other, and of a brownish-red color, with six minute black spots on each wing-case. These asparagus beetles are readily destroyed by dusting the plants with lime.

Trouble With the Churn.—Frank André, Knox Co., Tenn.: Probably the cream is too warm or too cold—most likely the latter. Stick a thermometer into it, deep enough to immerse the bulb, and hold it there a moment. The column in the tube should mark 64°. If the temperature of the cream is lower than this, stir in warm water; if higher, set the churn in a cool place until the cream cools off. Mixing a little warm water in the cream will make the churning easier in any event.

The Mosquito Nuisance.—G. Martin, Atlantic Co., N. J.: In our opinion it would be exceedingly bad policy to destroy all the mosquitoes, even were such a thing possible, because it is well known to all entomologists that the larva of this insect is a purifier of stagnant waters, which would otherwise exhale putrid miasmata, and be often the cause of fever and ague, and other disagreeable, if not fatal, disorders. Under the circumstances, we cannot second Mr. R. H. Lamborns' efforts in seeking to find some other and larger insect that could be increased in sufficient numbers to destroy or reduce the mosquito pest. The better and more sensible course to pursue would be to drain and purify stagnant pools, ponds, and cisterns; then the supply of food upon which the mosquitoes live would be cut off; and this insect must perish. The mosquito is a necessary evil, and must remain as such so long as we have putrid waters to be purified by such insects.

Roup in Fowls.—George W. Aiken, Ottawa Co., Michigan: From your description, it would appear that your fowls have roup. Carefully separate all affected fowls from the healthy ones. Dissolve an ounce of chlorate of potash in a quart of water; add ten drops of carbolic acid, and thoroughly swab the nostrils and mouths of the sick fowls with the solution three times a day. Keep them in a warm, dry place, and give soft food.

The Floyd Pecan.—A. P. Dennis, Linn Co., Iowa: The specimen of the Floyd Pecan-nut you send is certainly remarkable for size, measuring two and a quarter inches in length and one and a quarter in diameter. This is one-fourth of an inch longer than the great Nussbaumer Hybrid, found in Illinois a few years ago. This Floyd Pecan is nearly double the size of the celebrated Ladyfinger Pecan of Louisiana, and we have seen nothing of the kind from the South that approaches it in size. It is quite remarkable that pecan-nuts of such immense size should be found growing wild in our Northern States, and where no one ever thought of looking for such nuts a few years ago.

A Bit of Horse Sense.—When horses are kept standing idle in the stable by long-continued storms, the feed should be reduced accordingly. Full rations, with no exercise, is a frequent cause of spinal meningitis, and other serious ailments of horses.

Grafting.—E. S. Robbins, Westchester Co., N. Y.: Grafting is an operation that the nurseryman practices to produce a tree of a certain variety, and the farmer finds it useful to change the character of an established tree. If, when his young tree comes into bearing, he finds that a mistake has been made, and the wrong kind has been sent him, or that the tree, though true to name, is not suited to the locality or to the market, and is not likely to be profitable, instead of uprooting such trees, and planting others in the place of them, it will be much quicker to change such trees by grafting those we do not want to the kind that we do want.

Rat Destroyer.—Craig R. Arnold, Delaware Co., Pa.: A mixture of plaster of Paris and flour, left lying around near the haunts of rats, is recommended as a means of thinning them out. The plaster is supposed to become impacted in the stomachs of the rodents and cause death. The mixture must be kept beyond the reach of fowls, or they will be likely to share the fate of the rats.

Seradella — Kine - Pox.—Charles Deane, San Francisco Co., Cal.: (1) Seradella has proved itself to be admirably well adapted to dry situations on the Pacific slope, flourishing during the summer months when other vegetation is parched and withered. (2) The so-called cow-pox is a constitutional disease while it lasts, and the milk of an affected cow is unfit for use. The disease is communicated only by contact of the virus with an abraded surface on the hands, or actual introduction under the skin by means of an incision.

Clearing Land of Scrub-Oaks.—J. H. Smith, Kings Co., N. Y., desires information as to the most economical plan of clearing land covered with scrub-oaks, and asks if the land of Long Island, covered with such a growth, is valuable when cleared. The presence of scrub-oak, is not, of itself, an indication either of good or of poor land, although it abounds usually on poor soils; it is also found on very good land. It is a prevailing opinion that this species attains its small growth simply because the soil is not sufficiently strong to produce a larger growth. This is an error, however, as this is a dwarf species which would not grow large under any circumstances. Some of the scrub-oak land of Long Island is very good, but a large proportion of that bordering the Long Island railroad would produce excellent crops of vines, corn, potatoes, cabbage, peaches, and small fruits. It has but little recuperative strength, and requires liberal application of manures. If we take into consideration the cost of the land, the small expense for labor in working, we think many crops could be as profitably grown on this soil as anywhere. The clearing of the soil is a simple matter; go over the land with bush-hook and grubbing-hoe. Cut all growth clean to the ground, and as soon as the brush is dry burn the field over. The coming summer keep all the sprouts cut as fast as they appear, and burn again when dry. The second season the plow will find but little opposition in the way of roots. In many places potatoes can be planted, in others corn; where neither can be grown, sow buckwheat and the following season the land will be in a productive state. If peaches are to be grown, the trees may be set out as soon as the ground is burned over the first time, and the ground kept clear of sprouts and weeds by constant use of the bush-scythe.

Sow Eating Her Young.—T. L. Jennings, Darke Co., Ohio: This unnatural conduct on the part of the porcine mother is evidence of a morbid condition. She is costive and feverish. The proper preventive is cooling and relaxing food, such as boiled turnips, carrots, and other roots, mixed with milk, bran, and middlings, or small quantities of oil-meal. Some give raw pieces of salt pork, but this is a rather wasteful method.

How to Obtain the Reports of the American Pomological Society.—L. J. Winsor, Kent Co., R. I.: These reports are not for sale. The only way to obtain them is by becoming a member of the Society. The Biennial Membership fee is $4.00, and Life Membership, $20.00. Any one interested in fruit culture may become a member by sending the membership fee to the Treasurer, Benj. G. Smith, Cambridge, Mass. Each member receives a copy of the current report free, and also of as many previous reports as can be spared.

Arab Horses for Germany.—The Sultan of Turkey has sent six superb Arab horses to the German Imperial family as souvenirs of their visit last autumn to Constantinople. Two of the horses are for the Emperor William, and one each for the Empress, Prince Henry, the Duke of Mecklenburg and Count Herbert Bismarck.

Tar Roofing.—T. B. Orchard, M. D., Wayne Co., Pa.: Roofs of coal-tar and cement spoil the rain-water caught on them for culinary purposes.

Nasturtiums as House-Plants.—Just before the killing frost of last November a friend cut a bunch of nasturtiums in full flower. They filled two large vases, and were as beautiful a parlor ornament as one could wish for. To the surprise of all, they refused to wither; on the contrary, they rooted freely, and have since continued to produce their flowers and ripen their fruits in the window, as freely as when in the border. For house-plants where there is a southern exposure, there is no plant so showy, so prolific in foliage and flower, and so easily managed as the climbing nasturtiums.

Measuring Corn in the Crib.—D. C. Thompson, Pendleton Co., Ky., asks for a reliable rule for measuring corn in the crib. The best rule for measuring corn in the crib is the following: Multiply the length, breadth, and height together in feet to obtain the number of cubic feet. Multiply this product by four, strike off the right-hand figure, and the result will be the number of shelled bushels in all, very nearly.

American Horticultural Society.—The ninth regular meeting of the American Horticultural Society is to be held in Austin, Texas, beginning on February 17th instant.

Ormonde, the English Thoroughbred.—Joseph Tyler, Tompkins Co., N. Y.: This horse was sold last year by the Duke of Westminster for $75,000, and was at last accounts in the stud of Señor Salvador J. Boucan, at the estancia Luis Chico, Argentine Republic. It is reported by a Buenos Ayres paper that the Duke of Westminster has telegraphed an offer to buy back Ormonde at an advance of $50,000 on the large price for which he sold him. This is scarcely credible, however, as

the horse had become a roarer, or the Duke would not have sold him at any price. It was hoped that the South American climate would alleviate if not cure the infirmity. Even if these hopes are realized, it would scarcely be prudent to take the horse back to England.

Seeding to Clover.—J. M. Arnold, Hart Co., Georgia: The usual time to sow clover seed is as early as possible in spring. At the North it is sometimes sown on the surface of the snow, which, as it melts, lets the seed down to the ground In Georgia it may be sown in autumn and scratched in by dragging brush over it; or in February or March.

Growing the Mistletoe.—Miss B. S., Salem Co., N. J.: The English mistletoe will probably thrive in your garden if you can place it on some congenial tree, and in a somewhat protected situation, where it will not receive the full force of the cold northerly winds in winter. Take the seeds from the berries on the specimen you have just obtained, carefully remove the pulp, then cut a small notch in the bark of an apple tree, just under a branch, and slip in a seed, with the embryo or eye against the alburnia wood of the tree. Insert several in each tree, to increase your chances of success. The mistletoe will grow on several other kinds of trees, such as the basswood, maples, hawthorns, and mountain ash, but is said to thrive best on the common apple tree.

Sickly Fruit-Trees. — W. L. Dodge, Schuylkill Co., Pa.: If your peach, pear, and apple trees are all affected as you describe, we are inclined to think that the thorny appearance of the branches must be due to the presence of some insect. If you will send us a few twigs, we may be able to tell you how to get rid of the pest, if one is present. The trees need severe pruning and liberal applications of manure about the roots, to insure a vigorous growth, whatever may have been the cause of their present stunted appearance.

Oak-Bark. — S. Betram, Taos Co., New Mexico: Oak-bark is generally cut in the spring, because it may be more readily removed from the wood at that season than at any other. But there is another good reason for removing it at the season named, although not usually known even to those who gather this bark, and it is that oak-bark contains nearly or quite four times as much tannin in spring as during the early part of winter; consequently, is nearly four times as valuable. The acorn known as "Valonia" in commerce is the fruit of the *Quercus ægilops*, or great prickly-cupped oak. This oak is found in great abundance in the Morea and Levant, and the husks of the acorns are exported for use in tanning certain kinds of leather.

Grains of Paradise.—Mrs. L. M. B., Omaha, Neb.: The seeds you find referred to in an old English story-book, under the name of "Grains of Paradise," are the same as now called "Cardamons." In an old English book on plants, published three hundred years ago, the author says that these "grains of Paradise comfortteth and warmeth the weake, colde, and feeble stomacke."

Cornelian Cherry.—J. Bassett, Benton Co., Ore.: The fruit known as Cornelian Cherry is not really a cherry, but is produced by a large shrub belonging to the dogwood family. The fruit is oblong, clear, and shining, of a cornelian color, and an inch long, and about one-half inch in diameter. The fruit, when ripe, is edible, but rather too acid to suit most palates. It would, no doubt, thrive in the moist soils of Oregon, and is well worth cultivating as an ornamental shrub, even if no use is made of the fruit.

Pipe-Line Milk.—Milkman, Chester, Pa.: The idea of sending milk from Orange Co., N. Y., to this city through pipes, as now practiced with crude petroleum, probably originated in the brain of some reporter or correspondent of the daily press. When milk is sent to market in pipe-lines, fresh eggs will probably come in the same way, and just as safely. Progressive ideas are only valuable when practicable.

Holy-Grass. — "School-girl," Brooklyn, N. Y.: The grass known in European countries as Holy-grass (*Hierochloe Coreatis*) takes its name from the uses to which it has long been applied in Germany, where the plant is dedicated to the Virgin Mary, and strewn in the aisles of the churches and around the doorways on festival days. The scent of this grass is very sweet—somewhat like that of the vernal-grass. It is indigenous to the colder and northern parts of Europe, and is abundant in Iceland. It is also used for scenting linen: small bundles or a few stalks placed between the sheets or garments when packed in chests or closets. In Sweden small bundles are placed under the pillow to induce sleep.

Sugared Sweet-Flag. — Mignonette, Lowell, Mass.: There are several modes of preparing the candied or sugared sweet-flag root as sold in the candy-stores. One is as follows: Cut up the fresh and clean roots into pieces of the proper size, and, after drying for a few days, dip them in a hot, thick syrup, made with white sugar or rock candy and water. Then, as the pieces are dipped out, throw upon a wire screen, to drain for a few moments, after which, throw into a larger vessel and dust them over with powdered white sugar, shaking about until no more of the dry sugar will adhere. Sift out the surplus sugar, and pack the pieces in fancy paper boxes. We very much doubt, however, if it will pay you to go into this business, because the demand is limited, and those already engaged in it can readily increase the manufacture to almost any extent, as the supply of this root is almost unlimited.

The Stallion Belmont.—C. W. Jones, Lenawee Co., Michigan: Belmont was foaled in 1864, and died in Kentucky, last November. He was sired by Alexander's Abdallah, one of the earliest colts of Rysdyk's Hambletonian. Belmont was the sire of the great Nutwood, 2:18¾; Wedgewood, 2:19; Viking, 2:19¼; the pacer, Fred Arthur, 2:15½, as well as two other pacers and twenty-six trotters with records of 2:30 or better.

Destroy the Eggs.—If one will go through the orchard in winter, or any time before the leaves come out, and cut off and burn all twigs which have the eggs of the tent caterpillars, he will save much trouble. The eggs are in rings encircling the twigs. This preventive measure is practicable only with low-headed trees, unless a ladder is used.

The Chinese Sacred Lily.—L. M. Charles, Berks Co., Pa., asks for information about the Chinese Sacred Lily. This plant is not a lily proper, but a narcissus, *Narcissus Orientalis*. The class is better known in the trade as *Narcissus Polyanthus*. These bulbs abound in the warmer parts of China, growing in sandy, rocky swamps. They are grown successfully in water, or in pots, the same as the hyacinth. The novel way of growing them in gravel is simply the Chinese way of doing it. They bloom as well that way as any other, but not better.

Sugar-Cured Hams. — P. J. Armillo, Cheshire Co., N. H.: One of the most popular methods of sugar-curing hams is by dissolving one pound of coarse salt, with four ounces of sugar, in as little water as possible. Ordinary syrup may be used instead of the sugar. This pickle is boiled and skimmed, and, when cold, is poured over the hams, previously well rubbed with salt, and packed in a barrel.

Cure for Chilblains. — F. Foster, Ramsey Co., Minn.: There are so many remedies for chilblains that it would be difficult to select the best, but we know from experience that painting the affected parts with tincture of iodine is almost a specific.

The Best Use for Swamp Muck. — E. Wilson, Marion Co., S. C.: Probably the most advantageous use of muck is to scatter it in the stables or barnyard. There is a great difference in the fertilizing qualities of muck. The value of some beds consists of nothing but the vegetable matter contained in the muck, while others are rich in plant-food. Where the labor of digging and hauling is small, it generally pays to use large quantities.

Burning Oyster-Shells. — S. N. Walters, Baltimore Co., Md.: Oyster-shells may be burned in a similar manner to which charcoal is burned. The kiln for this purpose is made by placing a layer of dry wood on the ground, and arranging some sticks so that the draft is made towards the center of the heap, in which some sticks are placed so as to form a chimney. Then a layer of chips or brush is placed around this chimney, and on this oyster-shells and chips, alternately. When all are thus arranged the heap is covered with sods of grass or litter, leaving a few air-holes until the fire is well kindled, after which the holes have to be closed up entirely.

Garden Scholarships.—The trustees of the Missouri Botanical Garden at St. Louis have devised an admirable plan for carrying out the intention of the late founder of the garden, Henry Shaw, to provide adequate instruction for young men desiring to become gardeners. Six scholarships for garden pupils will be available after the first of April next, to be awarded to young men between the ages of fourteen and twenty. The course of study embraces six years. A salary of $200 the first year, $250 the second, and $300 thereafter, and free lodgings, pertain to the scholarships. Full particulars may be had by addressing Prof. Wm. Trelease, Director, 1,724 Washington Avenue, St. Louis, Mo.

Lime on Land.—Francis L. Smith, Rapides Parish, La.: Lime has so little direct value as a fertilizer that if applied alone to land which is destitute of the elements of vegetable growth, its effect would scarcely be perceptible. But on soils of moderate fertility lime acts very beneficially. It changes the mechanical condition of both light and heavy soils and liberates latent elements of fertility already in the soil. Nearly all ordinary soils, even those lying on limestone formations, are benefited by the application of lime at intervals of three to five years.

Baling Hay. — "Farmer," Franklin Co., Mass.: There is no reason why hay should not be baled as soon as it is made, provided it is thoroughly well cured.

Barley for Milch Cows.—G. L. Moore, Coos Co., Oregon: The old idea that barley was deleterious to milch cows has been effectually exploded by very successful experience in feeding it. Barley is, however, too rich in fat-forming elements, to make a good ration alone. It should be ground and the meal mixed with wheat bran, cotton-seed meal, or oil-meal. In the latter case it is best to give the mixed ration immediately after milking, to prevent imparting a peculiar flavor to the milk.

Horse Sausage.—M. L. Simpson, Herkimer Co., N. Y.: Yes, it is true that a man was arrested in Long Island City for working up old horses into Bologna sausages, and discharged by the court because it was found that he had violated no law of the State, so long as he used only healthful horse-meat. He claims, though, that he exports his equine sausages to Europe.

Death of John Henderson.—The eminent horticulturist named above died at his residence in Brooklyn, December 17. Mr. Henderson was born in London, England, Dec. 5, 1818. He came to the United States in 1856, and settled in Flushing, Long Island, where he continued to reside until 1888. He embarked in the business of horticulture, making a specialty of rose-growing, and maintained for many years a leading position as a rose-culturist. It was through his skill and enterprise that many of the finest greenhouse roses were introduced or first successfully cultivated in this country. Personally Mr. Henderson was a gentleman of refined and scholarly tastes, active and broad benevolence, public spirit, and devoted Christian character.

Canadian Fruit-Growers.—Southern Ontario is a natural fruit region, enjoying the same advantages as Michigan, in soil and the vicinity of large bodies of water. The apple is the leading fruit, and is grown in large quantities for export. Peaches, pears, and grapes are reliable crops near the lakes, but require the same care to keep in check the insect and fungus enemies as in the States. Peach- and grape-culture especially have received a remarkable impetus last season, and many new orchards and vineyards will be planted the coming season near Lake Erie. With peaches the tendency is toward closer planting and lower trimming. The secret of success with orchard fruits in Ontario generally is clean cultivation, good feeding, especially with wood ashes, thinning, careful packing, etc. At the winter meeting of the Ontario Fruit-Growers' Association in Windsor, A. M. Smith, of St. Catherine's, was elected president, and L. Wolverton of Grimsby re-elected Secretary.

AMERICAN AGRICULTURIST
FOUNDED IN 1842

FEBRUARY, 1890.

The World's Record Broken.

The crops of corn actually grown on one acre, in the AMERICAN AGRICULTURIST Prize Crop Competition for 1889, will alone amply repay us for all the great expense and labor involved in the enterprise. It is worth ten thousand dollars to demonstrate that such crops can be really produced on one acre. The award of the Wheat prizes in this issue, as promised, compels us to put over until the March number the wonderfully interesting comparison of the corn crops and the award of the corn prizes in full. It is due our readers, however, that the yield of the three largest corn crops be no longer withheld.

The AMERICAN AGRICULTURIST grand prize of Five Hundred Dollars in gold will be awarded to Zachariah Jordan Drake, of Marlborough Co., South Carolina. He will also receive a similar prize from the South Carolina Department of Agriculture, as this enterprising body offered to duplicate our prize if it was taken in that State. Mr. Drake's crop of corn on the ear from the exact contest acre weighed **17,407** pounds. The average of three tests, by as many witnesses, was that one hundred pounds of this corn contained only eighteen pounds of cob. Consequently, the gross weight named contained **14,273 3-4** pounds of shelled corn. At fifty-six pounds to the bushel, the crop was within a fraction of TWO HUNDRED AND FIFTY-FIVE BUSHELS (exactly 254 bushels 48¾ pounds) of shelled corn on one acre.

But this was the green weight, as taken from the field. According to analyses made at the South Carolina Experiment Station by Drs. W. B. Barney and J. B. McBryde, under the supervision of the director, Prof. S. M. McBryde, this crop was remarkably dry, as were all the corn crops in South Carolina. The shelled corn contained only 15 per cent of water. We find, therefore, that the 255 bushels of shelled corn contained 217 bushels of actual dry matter in the kernels, without any water whatever. On the basis of 10 per cent water for thoroughly crib-cured old corn, or kiln-dried corn, the yield was 239 bushels of shelled corn.

Summary of the AMERICAN AGRICULTURIST grand prize crop on one acre: Shelled corn—green, 255 bushels; crib-cured, 239 bushels; dry matter in the kernels (no water whatever), 217 bushels.

The second largest crop was grown by Alfred Rose, Yates Co., New York. His yield was 15,898 pounds of corn on the ear, averaging 26 per cent cob, or 213 bushels of shelled corn green weight; 191 bushels crib-cured, and 174 bushels of actual dry matter.

The third largest crop was grown by George Gartner, Pawnee Co., Nebraska, his gross weight of corn on the ear being 11,380 pounds. It averaged only 16 per cent cob, or 171 bushels green weight, 151 bushels crib-cured, and 137 bushels of dry matter. The fractions are omitted in all these data.

These crops break the world's record. The largest yield previously recorded was 200 bushels of shelled corn, green weight, alleged to have been grown by Dr. J. W. Parker, not far from Columbia, South Carolina, in 1857, and its accuracy has been questioned. But there is no doubt as to the complete honesty of these crops in the AMERICAN AGRICULTURIST Prize Crop Competition. Judgment should be suspended by the unbelieving until they read in the AMERICAN AGRICULTURIST for March how these most unprecedented crops were grown, and the great precautions that were taken to secure absolute honesty and faithful accuracy.

Certainly, the complete summary of the prize corn crops and the full award of premiums in the March number of the AMERICAN AGRICULTURIST will be awaited with intense interest. The considerable number of crops in excess of 100 bushels per acre, with the practical details of culture and the scientific investigations connected with the corn class of the AMERICAN AGRICULTURIST Prize Crop Competition, must make the forthcoming issue of this magazine an original contribution to progressive agriculture that will be of inestimable benefit to American farmers. The results in the AMERICAN AGRICULTURIST Prize Competition will never be equaled so far as corn is concerned, but, if its lessons are made use of, our corn product per acre will be very largely increased, and the farmers' profits correspondingly enhanced.

We may add, also, that the superb showing made by South Carolina will not be dimmed by the complete record of her contest corn crops. She has shown what can be accomplished in the agriculture of the New South. South Carolina's enterprise will not only be rewarded many thousand fold, but she has encouraged her farmers to make a showing that will be worth veritable millions to her sister States.

Better Tillage Needed.

The great impelling cause in the development of the agricultural territory of the United States has been the improvement of agricultural machinery. Without the aid thus afforded, the vast wheat area of the Northwest could not be cultivated, and our present food supply could not be produced without engaging the whole of our population in the occupations of the soil.

These improvements have been most largely in the line of quicker and better work in the operations of the harvest. We have not increased our facilities for rapid preparation of the soil, nor for planting the seed, in nearly the same proportion.

Formerly, a farmer was compelled to consider the harvest before he planted the seed. He must compute the amount of labor that he could command at the required time, and must sow no more grain than he felt assured he could harvest. Now, every possible effort may be put forth to sow the last available acre, in the assurance that modern machinery will enable us to harvest it properly.

The modern self-binder has increased the efficiency of one man in the harvest-field more than twenty-fold within the last generation; while, within the same time, the improvements in plows, harrows and drills have not at the best more than doubled his capacity in the operations of preparing and seeding the ground.

This unequal development has been detrimental to the best interests of our agriculture, which must usually depend upon the ability of the farmer to get the greatest product from a given area. When the amount to be planted was governed and limited by the possibility of the harvest, there was no temptation to hurry or slight the initial operations. On the contrary, as one man could plant more in area than ten men could harvest, there was every inducement for that thorough and careful tillage that would conduce to the largest yield. But now, when the case is very nearly reversed, there is no limit to the amount that one may plant, except the limit of land available, and the length of the season. So there is now every temptation to employ such methods as will result in covering the largest area.

While this condition exists, there is not much hope of increasing the average yield. But if the remedy does not come in any other way, it will come through the decrease (which is now apparent) in the average size of our farms. When the boundaries are narrowed for each individual, he will, from force of circumstances, spend the time and labor on ten acres that he now gives to twenty, and we may expect a proportionate increase in yield to result. And the experience of thousands of good farmers throughout the country in growing large crops in the AMERICAN AGRICULTURIST Prize Crop Competition shows that better tillage pays.

We have too long computed the greatness of our agriculture upon the false basis of our total production. If we can maintain our supremacy in that, and at the same time accomplish a great yield from a given area, we shall then have an agriculture that is truly great, and of which we may fairly boast.

Crop and Census Reports.

It is seldom that we give space to long extracts from government publications, but the article in our January number, from Mr. J. R. Dodge, deserves emphasis. It is too true that there is more or less opposition to the giving of not only crop reports but census returns among farmers throughout the country. Even intelligent farmers have in many cases not yet disabused their minds of the idea that census returns will affect their taxes. It should be thoroughly understood, however, that such returns bear no relation whatever to taxation.

The objection to reporting to the government the progress of crops or harvests is not due so much to fear of taxation as it is to the impression that these reports will inure to the benefit of speculators rather than of farmers. This idea is wholly wrong, for reasons that Mr. Dodge states with great clearness. Those who are prejudiced against him as the government's agent in collecting and publishing crop reports ought at least to have faith in this indorsement of his statements by the AMERICAN AGRICULTURIST, which farmers everywhere know would not advocate anything that would be detrimental to them.

This objection to crop reporting for the United States Department of Agriculture has been carried to such an extent that in some counties at the Southwest the Farm-

ers' Alliance has resolved not to co-operate in this work. By such a course they are making a great mistake. On the other hand, if the results of these reports could be placed more thoroughly among the farmers, the prejudice against them on the part of the least intelligent would be largely dispelled. The opposition comes mainly from the more ignorant body of farmers, not one in ten of whom ever reads a good agricultural journal. About the only way to reach this constituency with any great promptness is to have a summary of the monthly crop reports placarded in every post-office throughout the country. This summary is now telegraphed to the associated press and appears in all the principal daily papers and the agricultural press, so that those who do not receive it with promtpness are beyond the reach of the telegraph.

It is easier, however, to secure crop reports than to get accurate census returns of agricultural productions. Even our elaborate Tenth Census was quite unsatisfactory in relation to our farming interests. The next census, which is to be taken in June of this year, should be made far more complete. This can be accomplished if every farmer will keep the matter constantly in mind and prepare during the winter as accurate a statement as possible of his productions, cattle, etc. This matter should form a prominent topic at every Farmers' Institute this winter, and should be fully discussed at the meetings of the National, State, and County organizations of the farmers' great secret orders. Mr. Robert P. Porter, the superintendent of the census, will, we are sure, be glad to furnish advanced information and blank census returns for consideration at such gatherings.

The Department of Agriculture should take hold of this matter in earnest in co-operation with the census bureau. Plain and concise circulars could be prepared, and by the use of a little money and the application executively of some common sense, the question of census returns and crop reports could be brought to the favorable attention of every public or secret meeting of farmers throughout the country. The educational force of such a campaign would be immense. It could not fail to result in the most reliable and most comprehensive agricultural census we have ever had. This would prove exceedingly valuable as a basis for comparison of crop reports in future. As farmers learned to appreciate the work of the census, they would at the same time come to a right understanding of crop reports and would cheerfully co-operate with the Department in furnishing such reports in future.

A Hearty Recognition.

The *Rural New Yorker* of Jan. 4 says: "The results of the AMERICAN AGRICULTURIST prize contest fully show the capability of land." Brother Carman adds: "While our best efforts to raise at the rate of over 700 bushels to the acre on one-fortieth of an acre have failed, Mr. Coy succeeded in raising over 700 bushels on less than an acre." Mr. Carman further observes that he thus has to thank his friends of the AMERICAN AGRICULTURIST for being instrumental in proving his own proposition as to the possibilities of potato culture, adding that he has been "ineffectually working at it during the past ten years." This frank admission and handsome acknowledgment on the part of our contemporary is indeed gratifying. Mr. Carman has been a painstaking experimenter in the line of small-plot tests, which renders all the more pleasing his cordial recognition of the AMERICAN AGRICULTURIST'S successful attempts to demonstrate what farmers can accomplish at a practical profit by improved methods of culture conducted on a practical scale instead of on little plots.

THE NEW POTATO CONTEST.

Much Interest in the Competition for 1890.

Every Farmer who Proposes to Plant an Acre of Potatoes Can Compete.

The AMERICAN AGRICULTURIST offers $500 for the largest yields of potatoes grown on one acre by its subscribers during 1890, under the rules printed below. These prizes will be divided as follows:

THE AMERICAN AGRICULTURIST PRIZES:

FIRST—The AMERICAN AGRICULTURIST Grand Cash Prize for the largest yield of potatoes on one acre..... $200.00

SECOND—The AMERICAN AGRICULTURIST Cash Prize for the second largest yield on one acre.. 150.00

THIRD—The AMERICAN AGRICULTURIST Cash Prize for the third largest yield on one acre... 100.00

FOURTH—The AMERICAN AGRICULTURIST Cash Prize for the fourth largest yield on one acre.. 50.00

SPECIAL PRIZES.

MAPES CO.—If the AMERICAN AGRICULTURIST grand cash prize for the largest yield of potatoes on one acre goes to a crop grown exclusively on Mapes Potato Manure, the Mapes Formula and Peruvian Guano Co., of 158 Front street, New York city, will give Six Hundred Dollars, making the total cash obtainable for the first prize crop under these circumstances..... 800.00

MAPES CO.—Provided the above premium is not taken, the Mapes Formula and Peruvian Guano Co., of 158 Front street, New York, will give $600 in gold coin for the first, second, third, and fourth largest yields of potatoes grown in this competition with the Mapes Potato Manure exclusively; First prize, $225; Second prize, $175; third prize, $125; fourth prize, $75. Total..... 600.00

BOWKER FERTILIZER CO.—If the AMERICAN AGRICULTURIST grand cash prize for the largest yield of potatoes on one acre goes to a crop grown exclusively on the Stockbridge Potato Manure, the Bowker Fertilizer Co., of 43 Chatham Street, Boston, will give $600, making the total cash obtainable for the first prize crop under such circumstances..... 800.00

BOWKER FERTILIZER CO.—Provided the above premium is not taken, the Bowker Fertilizer Co., of 43 Chatham Street, Boston, will give $600 to the party who shall raise on Stockbridge Manure exclusively a larger crop of potatoes on a single acre than that which took the Grand Prize on Stockbridge Manure in the 1889 contest, viz., 738⅔ bushels..... 600.00

BOWKER FERTILIZER CO.—Provided the above premiums are not taken, the Bowker Fertilizer Co., of 43 Chatham Street, Boston, will give $600 in prizes, to be divided as follows, for the largest yields of potatoes grown exclusively on Stockbridge Potato Manure, viz., First Prize, $225, Second, $175, Third, $125, and Fourth, $75, aggregating..... 600 00

VERMONT STATE AGRICULTURAL SOCIETY.—If the AMERICAN AGRICULTURIST first prize of $200 for the best acre of potatoes is taken by a Vermont farmer, the Vermont State Agricultural Society (Col. George W. Hooker, president, Brattleboro) will give in addition to it $300, making the total cash obtainable for the best acre of potatoes if grown in Vermont..... 500.00

Provided the above premium is not taken, the Vermont State Agricultural Society will give $200, divided into prizes respectively for the five largest crops grown in that State of $100, $50, $25, $15, $10, or a total of..... 200.00

JOHN A. SALZER, La Crosse, Wis., for the largest yield of Salzer's new Gov. Rusk potato, grown in the AMERICAN AGRICULTURIST'S potato contest, $50 in gold. Second prize, $25 worth of seed, the prize-winner making his own selection from Salzer's Northern-grown seeds. Total..... 75.00

Similar prizes on Salzer's Ironclad potato..... 75.00

C. E. ANGELL, Oshkosh, Wis., if first prize goes to a crop from his seed will give..... 50.00

HOY POTATO DIGGER—For the largest yield in this competition on commercial fertilizers, any brand, The International Seed Co., Rochester, N. Y., offer a Hoy Potato Digger, price..... 65.00

WILLIAM DEERING & Co., Chicago, Ill., offer one of their New Deering Mowers, furnishing a machine cutting either four or four and a half feet, and with cutting sections either two and a quarter or three inches, as the winner may elect.

Additional prizes may be offered by other manufacturers, dealers in agricultural implements, State, county, and local agricultural societies, and others interested, the whole amounting to thousands of dollars in value, and being so numerous that nearly every good crop should receive a prize and due recognition and honor. Some of these special premiums are so offered that it may be possible for the largest crops to win upwards of $1000. The full details of the list of prizes offered will appear in the AMERICAN AGRICULTURIST later. The rules of the new contest, and the Book for Reports are much simpler than last year—so much so, that there is nothing to hinder any farmer from competing who plants one acre of potatoes.

THE RULES OF THE POTATO CONTEST FOR 1890.

1. Each contestant must be a paid subscriber to the AMERICAN AGRICULTURIST. Those whose subscriptions are paid for only to October, 1890, or to earlier dates, may contest upon renewing their subscriptions. All subscribers whose land is in North America may compete, no matter whether they subscribe directly, or through agents who are working for the liberal prizes offered in the AMERICAN AGRICULTURIST Premium List for 1890, or through other papers. New, as well as old subscribers, may compete.

2. Those who won prizes in the potato class of the AMERICAN AGRICULTURIST prize crop competion for 1889 cannot compete in this new contest.

3. To enter the contest, subscribers have only to notify the AMERICAN AGRICULTURIST that they propose to try for the prizes. This may be done by letter or postal-card, but such notices must be given before July 1, 1890, at latest.

4. The land must be just one acre (43,560 square feet), carefully measured by a surveyor before, or within thirty days after, planting, whose affidavit (made before a justice of the peace or notary public) will be required on the certificate for the purpose provided on Page 2 of the Book for Reports.

5. The hills or rows must be at least twelve inches from the boundary line of the acre. Only one crop from one planting will be counted; no second planting between the original rows or hills, will be permitted. Sweet potatoes cannot compete.

6. The AMERICAN AGRICULTURIST must be notified at least two weeks before the proposed date of the harvest, so that its representative may be present if possible.

7. The harvesting must be done in the presence of three disinterested witnesses. They must measure the land carefully, and, if not satisfied that it is the exact and original one acre, they will have it measured by a sworn surveyor. The witnesses must supervise the weighing of the crop. Their signatures, under oath, must attest the honesty and correctness of the contestant's report, on the certificate provided for the purpose in the Book for Reports.

8. A complete record must be kept of the crop, and must be given in the blank pages provided for the purpose in the Book for Reports. This can be done by answering, in the order named, the questions asked in the printed pages. Thus, the work of making out the report will be very simple—just answer the questions.

9. These reports must be made in the Book for Reports, which, with the report so made, must reach the AMERICAN AGRICULTURIST on November 5th, 1890, at the latest, and as much earlier as possible. A copy of the Book for Reports will be furnished free upon application.

10. The first of the AMERICAN AGRICULTURIST prizes will be awarded for the largest yield of potatoes in a single crop, on one exact acre, as reported in accordance with these rules. The second prize will go to the second largest crop, and so on. The special prizes will be given in order of value for the succeeding largest crops, except when special conditions are imposed, as in the fertilizer premiums, and some premiums offered in conjunction with ours by agricultural societies. These will be awarded according to the terms specified in the offer. All such offers, and the complete list of premiums offered, will be found in the AMERICAN AGRICULTURIST later.

Another Grand Prize Received.

I am happy to acknowledge the receipt of draft for $500 in gold for the AMERICAN AGRICULTURIST Grand Prize awarded me in the potato contest, for which accept my most sincere thanks. I am very much pleased with the way the Prize Crop competition has been conducted, from first to last. There has been fair play for all, and no partiality shown in its management. It cannot fail to be of great and lasting benefit to farmers throughout the country. For myself, I feel that what I have learned in this great contest is of more value to me than all the money I have taken in prizes, in that it has shown me what can be done on our soil with good cultivation and fertilizers. I intend to plant all my potatoes in this way another year, and no doubt you will hear of some more big yields from me next autumn. I feel confident that the new Potato Contest for 1890 will be managed with the same spirit of fairness and impartiality that characterized the first, and must be of great value, not only to those who take part in it, but to the country at large. These Prize Crop Competitions must be of enormous value to farmers all over the continent by stimulating them to better ways and methods of farming. One is struck with the necessity for this when we consider that the average crop of potatoes all over the United States was only seventy-six bushels to the acre. I consider the AMERICAN AGRICULTURIST the best agricultural journal published in this country. It should be in the home of every farmer, and I am determined to do all I can to extend its circulation. I expect to have a long list of subscribers to send you soon. I thank you again, dear sir, for your kindness and courtesy in this great competition, and wish you and the AMERICAN AGRICULTURIST the success which you so richly deserve.

CHARLES B. COY, Aroostook Co., Me.

PRIZE CROP COMPETITION.

The Wheat Contest.

Irrigation and Stable-Manure Win.--The First Prize Goes to Utah.

From nearly every State in the Union entries for the AMERICAN AGRICULTURIST Wheat contest were received, but, owing to an unusual season over vast areas of our country, the results are in a measure disappointing. More than one-half of all competitors withdrew before harvest-time, discouraged by the failure of their crops. While an unprecedented rainfall in the East has drowned the crops and hopes of many contestants, extreme drought had a similar effect with many in the West. T. A. Stanley writes from Connecticut: "My wheat crop was nearly a total failure. I had to give it up; the wet weather has ruined it;" and J. F. Langley reports from Maine: "The acre of wheat entered for competition is a dismal failure; storms and warm, cloudy weather have laid it low, never to rise again." In strong contrast is J. B. Neward's statement from Wyoming: "In this section we have experienced the dryest season ever known, in consequence of which the crops are very short, not having sufficient water to irrigate them." Nevertheless, valuable lessons were taught by this contest, and the following reports by successful competitors will be read with interest and profit:

The First Prize Crop.

The First-Prize Acre was twenty rods long and three rods wide. It was surveyed by Henry F. Burton of Salt Lake City, Utah, whose sworn certificate, signed by Justice Alma Pratt, vouches for the correctness of the statement. The harvesting and measuring was witnessed and sworn to by Albert G. Wagstaff, Joseph F. Andrew, and William Stevenson, all of Salt Lake City. The soil is a sandy loam, of medium moisture. The value of this land is from $1,200 to $1,500 per acre, owing to its proximity to the city, and the owner justly thinks that it is getting too high-priced for farming purposes. In 1885 the land was in potatoes, in 1886 in wheat, in 1887 in oats, and in 1888 in potatoes. The only fertilizer used was good stable manure, applied during the winter of 1887-88, at the rate of about fifteen wagon-loads to the acre.

Preparation of the Land.—In the beginning of November, 1888, the ground was plowed once, about six inches deep, at a cost of $1.50 for man and team. The field was neither cross-plowed nor harrowed, as Mr. Gibbey's experience leads him to think that if the land is left rough it affords better protection to the grain in winter than an entirely smooth surface, the uneven ground holding the snow better.

Seeding and After-Treatment.—About the middle of November, 1888, the seed was drilled in, three inches deep, with a Keystone Premium Drill, which has always given perfect satisfaction. The crop came up in the middle of February, 1889. It was neither rolled nor has it received any other attention of drilling until April 10, when it was rolled once. No other care was given until harvest time, and the prize acre received no different treatment from the general wheat crop on the farm, the entire yield of which averaged 70 bushels to the acre; not an uncommon occurrence in that locality, we are assured. One bushel and one peck of seed was sown on the acre. The name of the variety is not given, the same kind having been grown on the place for fifteen years, without change. Before sowing, the seed was treated with blue vitriol, and then dried in lime-dust.

Harvesting.—On July 19 the crop was harvested with a McCormick binder, at a cost of $2.50. The sheaves were shocked in the field, and thrashed on August 21. The crop on the contest acre made 918 bundles, and yielded a total weight of cleaned grain of 4806 pounds, or 80 bushels and six pounds. This being the largest yield obtained from one acre under the conditions of the AMERICAN AGRICULTURIST Prize Crop Competition, the AMERICAN AGRICULTURIST Grand Prize of $500 in gold is awarded to William Gibbey, Salt Lake City, Utah. A considerably larger yield, Mr. Gibbey states, would have been obtained had it not been for the English sparrows, which took a good share of the grain, and which are "a regular pest."

The Second Prize Goes to Colorado.

According to the sworn certificate of County Surveyor James M. Gardner, the contest acre of Robert C. Nisbet, Del Norte, Colorado, was 250.8 feet long and 173.684 feet wide. The soil is a sandy loam, naturally dry. The ground was first broken in 1882, planted to potatoes in 1883, and every year since up to the last. The yield of potatoes in 1886 was 400 bushels per acre. In 1885, and also in 1887, a dressing of about 16 tons of stable manure was given, and no other fertilizer has ever been used on the land. The land was harrowed on April 5, and the following day 140 pounds of Defiance wheat was sown broadcast by hand. The seed was plowed under three to three and a half inches deep, and the land harrowed and cross-harrowed with a Scotch harrow, no rolling being done, which, Mr. Nisbet states, is superfluous where irrigation is employed, as the water is apt to pack the soil rather more than is desirable. The seed came from Northern Colorado, 350 miles distant, and, before sowing, was soaked in a blue vitriol solution for five hours, to prevent smut. Mr. Nisbet thinks seed should be changed every three years.

Culture and Yield.—At the time of seeding, the weather was dry, but the ground was in favorable condition, and contained sufficient moisture for the germination of the seed, which came up in about thirty days. The first irrigating was done on May 24, by flooding from three small laterals or ditches, running east and west through the acre. On June 28 it was irrigated a second time. During July and August occasional showers occurred, so that it was not necessary to irrigate again. At the time of harvesting, the grain stood four feet high all over the field. On September 5 the crop was harvested with an Osborne binder. There were 854 bundles, which were thrashed on September 9. The total weight of the cleaned grain was 4,164 pounds, being 69 bushels and 24 pounds, a struck bushel of wheat weighing 60 pounds. The harvesting and measuring was witnessed by Roderick A. Chisholm, John S. Ryan, and Charles Carmean, and sworn to before Justice J. H. Burghardt, all of Del Norte, Colorado. The actual cost of producing an acre of wheat by irrigation Mr. Nisbet estimates at from $10 to $12. He is awarded the second prize, a Monarch incubator, contributed by James Rankin, South Easton, Mass.

Large Yields Without Irrigation.

The Third Prize.—J. H. Lee, Saluda, Indiana, wins the third prize, a Clark's Cutaway harrow, contributed by the Higganum Manufacturing Corporation, Higganum, Conn. The soil of the contest acre is a sandy clay loam, rather dry. The land is level, is situated about 500 yards from the Ohio river, and has been in cultivation for sixty years. In 1885 it was in oats, and from 1886 to 1888 in clover seed, during which period no fertilizer of any kind was used. It was plowed in July, 1888, about five inches deep, and again in August. It was harrowed twice and dragged twice, just before seeding. On October 10 one and a half bushel of Fultz wheat, graded as No. 2 Red, was drilled in, together with 166 pounds of Superior bone-meal. The seed was covered about one and a half inch, and has been grown on the farm for ten years without change. The weather was very favorable at the time of sowing, and the land in fine condition, so that the crop was well up in fifteen days. On April 15, 1889, four hundred pounds of wood-ashes were sown broadcast, after which no attention was given to the acre. The crop was cut, bound, and shocked on June 17, and thrashed on July 18, yielding 2,837 pounds (48 bushels and 17 pounds) of cleaned grain, or 60 pounds per bushel. The even bushel of this wheat weighed 64 pounds. Mr. Lee informs us that in previous seasons he has raised as much as 53 bushels of wheat per acre.

The Fourth Prize Crop.—This was grown by Bartholomew Gedney, White Plains, Westchester Co., N. Y., on a clay loam, naturally dry. This land is nearly level. From 1880 to 1887 the field was in meadow. When seeded down in 1880 it received a ton of bone per acre, and in 1884-5-6 the meadow was enriched each year with 2,400 gallons of liquid manure per acre. In 1887, 3,000 pounds of rich cow manure to every 30 feet square was plowed under, and corn planted. In 1888 the acre was in oats. On September 24 the ground was plowed five inches deep, and harrowed with a Thomas smoothing harrow, which Mr. Gedney considers the best implement for the purpose in existence. At the same time, 600 pounds of Mapes complete manure was broadcasted and harrowed in. On the same day the ground was plowed, one and a half bushels of White Beardless wheat was sown broadcast, with a Cahoon hand-seeder, which has always given perfect satisfaction. The seed used was grown in this locality for five years, and apparently without deterioration. It was harrowed in about two inches deep, but not rolled. The weather, at the time of sowing, was warm and fair, and the green blades soon became visible all over the ground. On July 2 the crop was cut, with an Advance reaper, bound the same day, and put in shocks of 100 sheaves each. On July 5 the shocks were opened to the sun, and drawn to the barn, where they were thrashed, in the presence of sworn witnesses. The weight of the cleaned grain was 2,730 pounds, or 45 bushels and 50 pounds of wheat, an even bushel weighing 60 pounds. Mr. Gedney is awarded the fourth prize of an assortment of small fruits, contributed by the Jewell Nursery Co., Lake City, Minn., and also a ton of Mapes manure, contributed by the Mapes Formula and Peruvian Guano Co., 158 Front street, New York, for the largest yield on this fertilizer.

Other Crops.—Mrs. A. O. Woodford, Trumbull Co., Ohio, got an average of 41 bushels on five acres, the contest acre yielding 41½ bushels, at a total cost of $16, and capturing the fifth prize, a Tornado seeder, contributed by the Whitman Agricultural Co., St. Louis, Mo. Mr. W. T. Greider, Lancaster Co., Penn., takes the sixth prize, 20 of Houghton, Mifflin & Co's $1.50 books, given by Lawson Valentine; and also a ton of Bowker's Hill and Drill phosphate, for the largest yield on that fertilizer—40 bushels—given by the Bowker Fertilizer Co., Boston and New York. To D. M. Cassleburg, Lower Providence, Penn. (yield 38 bushels 14 pounds), is awarded the set of Loudon hay tools contributed by the Loudon Machinery Co., Fairfield, Iowa. F. J. Canfield, Yam Hill Co., Oregon, receives, for a crop of 34 bushels 10 pounds, the last prize: No. 2 Adjustable Iron-clad harrow, given by S. Hutchinson, Griggsville, Ill.

Echoes of the Contest.

I see in the AMERICAN AGRICULTURIST that the yield of oats on the prize acre was large, nearly 135 bushels; but I have known a still larger to be grown on one acre. Colonel Willy, of Lancaster county, in our State, made, a few years, ago 145 bushels on one acre—the largest yield I ever heard of—and I know it to be a fact.

R. R. T. GILLESPIE, York Co., S. C.

I may say that I am very glad that you have instituted the prize crop competition, not only because it gives impetus to better farming, but it opens the eyes of a good many farmers to the advantage of a better keeping of accounts.

JOHN G. PAVEK, Orange Co., N. Y.

New Methods Introduced.—Not only the prize-crop contestants, but many others with whom I have conversed on this subject, have been watching with much interest the experiments carried on the past season under the auspices of the AMERICAN AGRICULTURIST Prize Crop Competition, and express a determination to modify their old methods of cultivation considerably. They will, no doubt, be much benefited by so doing. I wish you much success.

C. S. PHINNEY, Cumberland Co., Me.

The AMERICAN AGRICULTURIST Prize Crop Competition has done more to develop interest in agriculture than all the experiment stations and colleges in the United States. Every contest acre of corn in this State has been carefully watched, not only by the contestants, but by many others. In most cases the grower, as well as other farmers, have discovered some errors or mistakes that were made the past year, and that we can improve upon next year. R. R. HUDGINS, Clarendon Co., S. C.

I wish to enter the potato contest for 1890, not with much expectation of getting a prize, but, by using one ton of fertilizer, and taking good care of the crop I think that the extra yield will make the acre more profitable than if I half worked five acres. R. W. STRICKLAND, Orleans Co., N. Y.

Mr. G. H. Heffner, Bedford Co., Penn: As you suggest, it will be possible to publish in the AMERICAN AGRICULTURIST the full details of but comparatively few of the prize crops. Among those published will be several representatives of the methods whereby fair-sized but not extraordinary crops were grown. Such reports are quite as valuable, if indeed they are not more so, than the system by which abnormal yields were obtained. The work of every contestant who sent in a completed report will be embraced in book form later.

G. W. Moore: Our object in excluding from the contest of 1890 the prize winners in the potato class of the AMERICAN AGRICULTURIST competition for 1889, is to stimulate other farmers to better efforts in potato culture. The prize-winners last year should need no inducement to good farming in future. Our object is not so much to stimulate abnormal yields as it is to encourage the ordinary farmer to better culture and better profits.

WELLS, RICHARDSON & CO'S
IMPROVED
Butter Color.
EXCELS IN { STRENGTH / PURITY / BRIGHTNESS

Always gives a bright natural color, never turns rancid. Will not color the Buttermilk. Used by thousands of the best Creameries and Dairies. Do not allow your dealer to convince you that some other kind is just as good. Tell him the BEST is what you want, and you must have Wells, Richardson & Co's IMPROVED BUTTER COLOR. For sale everywhere. Manufactory, Burlington, Vt.

BABY PORTRAITS.

A Portfolio of beautiful baby pictures from life, printed on fine plate paper by patent photo process, sent free to Mother of any Baby born within a year. Every Mother wants these pictures; send at once. Give Baby's name and age.
WELLS, RICHARDSON & CO.,
BURLINGTON, VT.

JONES
HE
PAYS the FREIGHT
5 Ton Wagon Scales,
Iron Levers, Steel Bearings, Brass Tare Beam and Beam Box for
$60.
Every size Scale. For free price list mention this paper and address
JONES OF BINGHAMTON,
BINGHAMTON, N. Y.

BOOKS 2c EACH 400 to select from. NOVELS and other works by popular authors, unabridged. Sample novel and catalogue for only 3 cents, post-paid.
F. W. BENTON, Publisher, St. Louis, Mo.

Some Children Growing Too Fast

become listless, fretful, without energy, thin and weak. But you can fortify them and build them up, by the use of

SCOTT'S EMULSION

OF PURE COD LIVER OIL AND HYPOPHOSPHITES
Of Lime and Soda.

They will take it readily, for it is almost as palatable as milk. And it should be remembered that AS A PREVENTIVE OR CURE OF COUGHS OR COLDS, IN BOTH THE OLD AND YOUNG, IT IS UNEQUALLED. *Avoid substitutions offered.*

RELIABLE TESTIMONY.

Among those who testify to the merits of

ALLCOCK'S POROUS PLASTERS

are Mrs. Henry Ward Beecher, Hon Sam'l J. Randall, Cyrus W. Field, Jr., Hon. James W. Husted, Charles D. Fredricks, Hon. E. L. Pitts, Gen. F. B. Spinola, George Augustus Sala, Marion Harland, and Sisters of Charity, Providence Hospital, Washington, D. C.

Beware of imitations, and do not be deceived by misrepresentation. Ask for **ALLCOCK'S,** and let no explanation or solicitation induce you to accept a substitute.

Over 13,000,000 Sold to Replace Various Other Kinds.

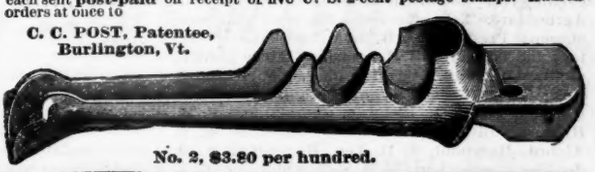
Spout No. 1, $4.00 per hundred. Actual size, with heavy Wire Hanger that does not break as do cast-iron hangers on other make of spouts.

SUGAR MAKERS acknowledge a very large increase in the flow of Sap by the use of the Self-Sealing Air Trap in the IMPROVED EUREKA, as claimed for them.

☞ If SUGAR MAKERS fail to get a supply of these Spouts of a hardware dealer or agent, I will deliver to any R. R. Station in the U. S. east of the Mississippi River, charges prepaid, not less than 100, on receipt of prices here given. Samples of each sent post-paid on receipt of five U. S. 2-cent postage stamps. Address orders at once to

C. C. POST, Patentee,
Burlington, Vt.

SEND FOR DESCRIPTIVE CIRCULAR.



No. 2, $3.20 per hundred.

This Knife and 7-in Shears, post-paid, $1.

Cut is exact size; common price 75c, our price 48c; best razor-steel blades, $5 for $2; Gent's fine 3-blade, $1; boys' 2-blade 25c; lady's pearl 35c; pruning, 75c; budding, 55c; grafting, 25c; hollow-ground razor, $1.25, postpaid. 7-in Best steel shears, 60c. Special Offer! This knife and 7-in shears, post-paid, $1. Illus. list free, and "Hints on Sharpening Tools." MAHER & GROSH, 4 S St., Toledo, Ohio.

BUY THE WRINGER THAT SAVES THE MOST LABOR

OUR PURCHASE GEAR
Saves half the labor of other wringers, and costs but little more.
EMPIRE Does not GREASE The CLOTHES.
Solid White Rubber Rolls. Warranted.
Also "DAISY" and "VOLUNTEER" WRINGERS,
Clothes Drying Bars, etc. Agents wanted everywhere. Empire Wringer Co., Auburn, N. Y.

H. W. JOHNS'
ASBESTOS
Plastic Stove Lining
For Lining or Re-lining
Stoves, Ranges, Furnaces, etc.
Cheaper and more durable than Fire Brick.
—EASILY APPLIED—
H. W. JOHNS' MFG. CO.
87 Maiden Lane, N. Y.

Farmer's Favorite
GRAIN DRILLS.
The greatest variety, and in popular styles; unequaled in leading features. Send for circular. Mention this paper.
Bickford & Huffman, Macedon, N. Y.

Established JACKSON BROTHERS, 1852.
New York State Drain-Tile and Pipe Works,
MAIN OFFICE, 88 Third Ave., ALBANY, N. Y.

ROUND, SOLE AND HORSE-SHOE TILE.
Over 13 Inches Long. By Cargo or Smallest Quantity. Price List on Application. Prices that cannot be undersold. Our new improved Machinery makes a Superior Round Tile, excelling anything offered before and at greatly reduced prices. First premium wherever exhibited. Also, wholesale agents for the celebrated Akron Salt-Glazed Sewer-Pipe. Prices low for small or large orders.

BEES AND HONEY
The Dovetailed Strongest, Best and Cheapest BEE-HIVE for all purposes. Pleases everybody. Send your address to the Largest Bee-Hive Factory in the World for sample copy of Gleanings in Bee Culture (a 32 illustrated semi-monthly), and a 44 p. illustrated catalogue of Bee-Keepers' Supplies. Our A B C of Bee Culture is a cyclopedia of 400 pp., 6x10, and 300 cuts. Price in cloth, $1.25. ☞ *Mention this paper.*
A. I. ROOT, Medina, O.

MAILED FREE A *Catalogue* of the Choicest mailing-size TREES, Flowering SHRUBS, GRAPE-VINES and Small Fruits.
The WM. H. MOON CO., Morrisville, Pa.

SORGHUM HAND BOOK for 1890, with full information as to seed culture and manufacture, sent free.
Blymyer Iron Works Co., Cincinnati, O.

SCIENCE IN FARMING.

Station Workers in Council.

A useful meeting was the third annual convention of the Association of American Agricultural Colleges and Experiment Stations, held at the United States Department of Agriculture in Washington, the middle of November. It was marked by a less exclusive spirit than its predecessors. The membership was extended to workers at experiment stations, and others interested were welcomed to the courtesies of the floor. Provision was made for working sections of entomology, agriculture, horticulture, botany, and chemistry. The discussion indicated that the stations were finding, as the novelty of the thing wore off, that one of their greatest difficulties was in interesting farmers in their work. Illustrative exhibits at fairs and institutes, with accompanying descriptive matter in print or in the form of lectures, were advanced as excellent plans for attracting notice and enabling farmers to profit by the stations' work. Our own opinion is that the stations must give increasing attention to this department of their duties, and indeed this is the general idea of most of the directors. The convention voted to co-operate with the Department in experimental culture of fibrous plants. Amendments to the Hatch act were tabooed. The independence of stations from colleges was insisted upon. The strictest accountability for the proper use of the appropriations by the stations in every State was demanded. Offensive personalities in bulletins were frowned upon. The laboratory methods adopted by the Association of Official Agricultural Chemists were indorsed. The seventy-two delegates, representing thirty-four States, enjoyed an evening reception at the home of the Secretary of Agriculture. New officers for the next year were chosen: President, J. H. Smart, Indiana; Secretary and Treasurer, H. P. Armsby, College Station, Center Co., Penn.; Vice-Presidents, M. H. Gates, New Jersey, George T. Fairchild, Kansas, F. A. Gully, Texas, R. P. Redding, Georgia, and E. W. Hilgard, California; Executive Committee, H. E. Alvord, Maryland, S. D. Lee, Mississippi, E. H. Jenkins, Connecticut, W. H. Scott, Ohio, and M. A. Scovell, Kentucky.

Latest from the Stations.

Out-door fattening proved more expensive than in-door feeding in a test with twelve steers at the Iowa Station for nearly three months. The difference more than made up for the cost of shelter.

Field-cured corn fodder proved more digestible than ensilage at the Pennsylvania Station (Bulletin 9). The difference was greatest in case of the woody fiber and but slight for the other ingredients. But, at best, all results on this point are conflicting, and further investigation is necessary.

Damaged cotton-seed meal has a dark color, and while it is probably unfit for cattle food, it is rarely injured as a fertilizer, according to the Louisiana Experiment Station (Bulletin 25). The same authority says that the best meal should always contain, of nitrogen seven per cent., phosphoric acid three per cent, and potash two per cent. Pure, undamaged meal should be dry, pulverant, and of a bright yellow color.

Bulletins filled with illustrated descriptions of our best grasses are not original contributions to science, but are of value to farmers who will study them. Indiana Bulletin 29 is a sample of this kind of work. But its usefulness to those for whom it is intended would be enhanced by two or three pages of practical directions for grass culture based on actual experience.

Experiments imply that soils acquire nitrogen from the air by the aid of microbes, or electricity, or probably both (Storrs, 5). They suggest that the microbes connected with the root tubercles of leguminous plants are the agents by which plants obtain nitrogen from the air. As to whether the nitrogen which plants obtain is the free or combined nitrogen, these experiments do not bring absolute proof, but the quantities obtained are so very large as to leave little doubt that it is free nitrogen.

New Mexico has established an agricultural college and experiment station at Las Cruces. Prof. Hiram Hodley is the president and director. A large farm, a few buildings, and an income of about $12,000 are the present basis of the institution. An effort to secure $15,000 from Congress under the Hatch experiment station act is being made. Under the precedent established in the case of Dakota, any territory that maintains an agricultural college is entitled to the Hatch fund for an experiment station in connection therewith.

The best trees for wind-breaks in the Northeastern States are Norway spruce and Austrian and Scotch pines, among the evergreens. Among deciduous trees, most of the rapidly-growing native species are useful. A mixed plantation, with the hardiest and most vigorous deciduous trees on the windward, is probably the ideal artificial shelter-belt (Cornell, 9). In interior places, dense or broad belts, of two or more rows of trees, are desirable, while within the influence of large bodies of water thin or narrow belts, comprising but a row or two, are usually preferable.

The Digests of the Annual Reports of the Agricultural Experiment Stations in the United States for 1888, which have been published by the Department of Agriculture, is an exceedingly interesting document. Many of the farmers, of course, cannot procure the bulletins from all the States, but in this document they get the gist of the most practical portions of the annual reports of all the different Stations. Any readers of the AMERICAN AGRICULTURIST can obtain this document of 258 pages free upon application to the Secretary of Agriculture, Washington, D. C.

An interesting series of tests is being conducted with five herds of three cows each at the New Jersey Station (Bulletins 57 and 61). The mixed milk of the morning and evening product of the whole herd was taken for analysis every two days and of individual cows once every five days, and the average per cent of the total solids in the milk of the herds are here given:

	August.	*Sept.*	*Difference.*
Ayrshire	11.76	12.19	0.43
Guernsey	12.99	13.56	0.57
Holstein-Friesian	12.18	12.45	0.23
Jersey	13.37	13.70	0.33
Shorthorn	12.10	12.32	0.22

The history, nature, and treatment of hog cholera, as determined by the Bureau of Animal Industry, make a document of 193 pages. The report is of little practical value. Preventive measures include isolation and cleanliness, combined with simple measures of disinfection. The ravages of hog cholera may be checked by separating the well from the diseased animals. Medicines appear to be of little use, and inoculation is not a satisfactory preventive. Infected premises may be made safe for new hogs by disinfecting with lime and allowing three or six months to elapse after the disease has disappeared.

The loss of farmyard manure by leaching and fermentation is a big item. In the case of fresh horse manure, the plant food in which was worth $2.45 when fresh, its fertilizing value was only $1.42 after exposure out-doors for six months,—a loss of 42 per cent. Mixed horse- and cow-manure in a compact mass and so placed that all water falling on it quickly runs through and off, is subjected to a considerable though not so great a loss. No appreciable loss takes place when manure simply dries (Bulletin 13, Cornell). This last point is an important one, and demonstrates that manure can lose very little by evaporation.

Four years of accurate feeding trials with milch cows, summarized in Bulletin 35, Massachusetts, afford practical lessons. Fourteen different rations were fed, costing on the average twenty-two cents per day for each cow. But the nitrogen, potash, and phosphoric acid voided in the manure daily was eight cents value on the average. If, therefore, all the manure is carefully saved and utilized, the actual net cost of the daily feed of each cow averaged only fourteen cents. The same thing is shown in another way in this table:

Name of Feed.	*Market Price per ton.*	*Value of Manurial Constituents per ton.*	*Net Cost per ton.*
English hay	$15.00	$5.58	$10.54
Rowen (dry)	15.00	9.83	7 14
Fodder corn (dry)	5.00	4.53	1 38
Corn stover (dry)	5.00	3.21	2.43
Corn ensilage	2.75	1.56	1.50
Corn meal	21.90	6.51	16.69
Wheat bran	20.70	13.64	9.79
Gluten meal	23.40	15.23	11 22

An attractive short course in agriculture is being well patronized this winter by Indiana farmers and their sons at Purdue University. The course is to be six weeks long, and includes lectures by Prof. H. E. Stockbridge, on agriculture and soils; Dr. T. D. Hinebouch, on veterinary topics; Prof. J. C. Arthur, on practical botany, plant diseases, and bacteria; Prof. Stanley Coulter, on zoölogy and the animal organism; Prof. James Troop, on practical horticulture and bee-keeping; F. M. Webster, on insect friends and foes; Prof. W. C. Latta, on practical agriculture and stock feeding; Dr. W. E. Stone, on the elements of chemistry; Prof. H. A. Houston, on the chemistry of foods, fertilizers, and dairy products; Jonathan Periam, on breeds; J. J. W. Billingsly on drainage; A. A. Rice, on farm law; J. A. Mount, on farming as a business; Mrs. H. C. Meredith, on dairying; James Matherson, on care of dairy stock and products.

The best practical treatise on the smut of wheat and oats is by J. C. Arthur (Bulletin 28, Indiana), republished in Bulletin 11 of the Nebraska station. The disease does not spread from plant to plant or from field to field, but the infection always takes place at the time the seed sprouts. No remedy can be applied after the grain is sown, but the disease can be prevented by sowing clean seed in a clean soil and covering well. If a farm is already infested, seed known to be pure can be obtained, or the smutty seed can be purified by thoroughly wetting with a solution of blue vitriol, using one pound or more to a gallon of water, and either sow damp, or first dry with plaster or slaked lime. Take care that all implements coming in contact with grain to be used as seed are thoroughly disinfected, if they have been previously used for smutty wheat. Immediately follow smutted wheat with some other crop. Do not apply stable manure or permit stock to run on land to be put to wheat, if smutty grain or straw has been used for feeding or bedding. Use a variety of wheat least affected by smut, and where there is danger of infection, do not sow on wet or insufficiently drained land.

FRESH FROM THE PRESS.

ALABAMA—Exp. Sta. at Auburn, Bul 7. October, 22 pp., experiments with vegetables, methods of setting milk, meteorology, biology; Bul. 8, November, 16 pp., commercial fertilizers.

CALIFORNIA—Exp. Sta. at Berkeley, Bul. 83, the rise of the alkali in the San Joaquin Valley; Bul. 84, distribution of seeds and plants.

COLORADO—Exp. Sta. at Fort Collins, Bul. 9, 28 pp., silos and alkali.

CONNECTICUT—Storrs School Exp. Sta. at Mansfield, Bul. 5, October, 20 pp., atmospheric nitrogen as plant food. Exp. Sta. at New Haven, Bul. 100, 28 pp., analyses of the potash salt sylvanit, unleached wood ashes, and of all commercial mixed fertilizers sold in the State.

DELAWARE—Exp. Sta. at Newark, Bul 6, October, 32 pp., summary of experiments on the black rot of grapes.

INDIANA—Exp. Sta. at Lafayette, Bul. 29, 44 pp., 19 illus., grasses of Indiana.

KANSAS—Exp. Sta. at Manhattan, Bul. 8, October, 24 pp., 4 plates, primary report on smut in oats; Bul. 9, December, 26 pp., 5 plates, experiment in pig-feeding.

LOUISIANA—Exp. Sta. at Baton Rouge, Bul. 24, 28 pp., rice and its by-products; Bul. 25, 32 pp., analyses of commercial fertilizers.

MASSACHUSETTS—State Board of Agriculture, monthly crop reports; Bul. 35 of the meteorological report. Hatch Exp. Sta. at Amherst, Buls. 10, 11, and 12 of the meteorological report; special bulletin, November, 8 pp., the gypsy moth.

MICHIGAN—Exp. Sta. at Agricultural College, Bul. 54, October, 10 pp., experiments and observations on the jack-pine plains.

NEVADA—Exp. Sta. at Reno, Bul. 6, September, 18 pp., meteorological report for July, August, and September.

NEW HAMPSHIRE—Exp. Sta. at Hanover, Bul. 8, November, 18 pp., principles of feeding, corn meal, middlings, shorts and cotton seed compared.

NEW JERSEY—Exp. Sta. at New Brunswick, Bul. 59, 22 pp., analyses and valuations of complete fertilizers; Bul. 60, 12 pp., ground bones and miscellaneous samples; Bul. 61, 12 pp., experiments with different breeds of dairy cows; Bul. 62, 40 pp., the horn fly.

NEW YORK—Cornell University Exp. Sta. at Ithaca, Bul 10, October, 20 pp., 2 plates, tomatoes; Bul. 11, November, 20 pp., on a saw-fly borer in wheat; Bul. 12, December, 8 pp., a new apparatus for drying substance in hydrogen and for the extraction of the fat; Bul. 13, December, 20 pp., 3 illus., the deterioration of farm-yard manure, by leaching and fermentation, the effect of a grain ration for cows at pasture. State Exp. Sta. at Geneva, Bul. 18, November, 42 pp., testing of dairy breeds.

NEBRASKA—Exp. Sta. at Lincoln, Bul. 2, December, 98 pp., the smut of wheat and oats and of Indian corn a preliminary enumeration of the rusts and smuts of Nebraska, notes on some fungi observed in Lancaster county during 1889; observations on the cotton wood.

OHIO—Fourth annual report of the Ohio State Forestry Bureau, 162 pp., 9 illus. Proceedings of the 10th annual meeting of the society for the promotion of agricultural science held at Toronto, Canada, 1889, 114 pp.; William R. Lazenby, secretary, Columbus. Exp. Sta. at Columbus, Bul. 1, Vol. 1, technical series, preparatory stages of the 20-spotted lady-bird, studies in pond life, a partial bibliography of insects affecting clover.

OREGON—Exp. Sta. at Corvallis, Bul. 3, October, 26 pp., practical work with insecticides, corn worm, spraying machines, directions for sending insects, and investigations on plants poisonous to stock.

PENNSYLVANIA—Exp. Sta. at State College, Bul. 9, October, 16 pp., digestibility of corn fodder and silage. Annual report for 1889, 242 pp.

SOUTH CAROLINA—Tenth annual report of the board and commissioner of agriculture, 168 pp.

VERMONT—Exp. Sta. at Burlington, Bul. 17, October, 14 pp., test of dairy cows at Vermont State fair.

UNITED STATES DEPARTMENT OF AGRICULTURE at Washington, D. C.:—*Botanical Division*—Special bulletin on the agricultural grasses and forage plants of the United States, 144 pp., including a glossary of terms used in describing grasses, and a copious index of 114 plates.

ONTARIO—Department of Agriculture at Toronto, Bul. 1, 16 pp., the flour moth. Bureau of Industries at Toronto, Bul. 31, statistics of crops in Ontario.

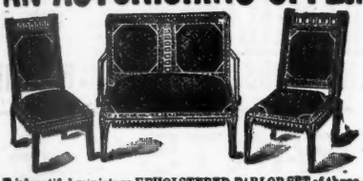
Best of Its Kind.—The AMERICAN AGRICULTURIST we consider to be the best publication of its kind in the country. J. N. PALMER, Woodbury Co., Ia.

Henry M. Stanley.

STANLEY, the world's greatest explorer, has just returned to civilization. No achievement of modern times can compare with this latest expedition. The whole world is throwing up its hat and shouting: "Hurrah for Henry M. Stanley!" What does that mean to you? It means an opportunity to quickly make thousands of dollars in carrying to the people the complete history of the wonderful achievement and remarkable discoveries as contained in our great work, "Heroes of the Dark Continent; or, How Stanley Found Emin Pasha." It is the grandest and best. Hundreds and hundreds of beautiful and original illustrations. The book may be truly called "Pictorial Africa." Complete outfit only $1.00, and we refund this when you have sold only ten copies. If you can give a part or all of your time to this enterprise, you will find a new El Dorado—a real, live bonanza—right at your door. Now is the time; do not wait a moment. Our terms are liberal; send on your $1.00 for outfit. If you don't like it send it back and get your money. Distance is no hindrance. Books are delivered to all parts of the country promptly, and at our expense. No capital needed except cost of outfit. We can and will satisfy you in every way. Apply to

B. F. JOHNSON & CO.,
No. 1009 Main St.,
Richmond, Va

AN ASTONISHING OFFER



This beautiful miniature UPHOLSTERED PARLOR SET of three pieces (for the next 60 days) will be sent to any address on receipt of 95 cents to pay expenses, boxing, packing, advertising, etc. This is done as an advertisement and we shall expect every one getting a set to tell their friends who see it where they got it and to recommend our house to them. This beautiful set consists of one sofa and two chairs. They are made of fine, lustrous metal frames, beautifully finished and decorated, and upholstered in the finest manner with beautiful plush (which we furnish in any color desired). To advertise our house, for 60 days, we propose to furnish these sets on receipt of 95 cents. Postage stamps taken. No additional charge for boxing or shipping; order immediately. No attention paid to letters unless they contain 95cts. R. W. SEARS, & CO. Minneapolis, Minn.

To introduce our publications, we offer **186 full-size pieces music**, including **112** Jigs, Polkas, Waltzes, Reels, etc., for piano or organ; **12** selections for the violin, and **60** of the most popular songs of the day arranged by that great composer CHARLES D. BLAKE. This grand collection and our complete catalogue of musical goods, forming altogether a book of **136** large pages, sent to any address on receipt of **20 cents**, stamps or silver. Address **Galaxy of Music, 408 Washington Street, Boston, Mass.**

GRIND YOUR OWN Bone, Meal, Oyster Shells, Graham Flour & Corn, in the **$5 HAND MILL** (F. Wilson's Patent), **100 per cent.** more made in keeping Poultry. Also POWER MILLS and FARM FEED MILLS. Circulars and testimonials sent on application. WILSON BROS. Easton, Pa.

BEECHAM'S PILLS
ACT LIKE MAGIC
ON A WEAK STOMACH.
25cts. a Box
OF ALL DRUGGISTS.

OPEN TO CONVICTION

Read and Decide for Yourself.

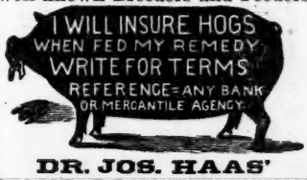
"Dr. Haas' Hog Remedy is a certain preventive of Disease, making pigs thrive well and gain flesh fast."

J. H. WALTON, Birmingham, England, (Purveyor to H. M. the Queen, and H. R. H. the Prince of Wales.)

"Pigs fed with Haas' Remedy I consider cholera proof." JOHN HORTON, Unadilla, Neb.

"Would not be without it."
HENRY FOSTER, M. D.,
Prop. "Sanitarium," Clifton Springs, N. Y.

And hundreds of similar testimonials from well known Breeders and Feeders.



DR. JOS. HAAS'
HOG AND POULTRY REMEDY

USED SUCCESSFULLY 14 YEARS.

PREVENTS DISEASE, STOPS COUGH, INCREASES FLESH, | ARRESTS DISEASE, EXPELS WORMS, HASTENS MATURITY.

PRICES: 25 lb. cans, $12.50; $2.50, $1.25 and 50c. a package. Largest are cheapest. **Orders by mail receive prompt attention.** Write for circular. Send 2 ct. stamp for "Hogology," a 64 page pamphlet on swine. Mention this paper. **JOS. HAAS, V.S., INDIANAPOLIS, IND.**

TORNADO BROAD-CAST SEED SOWER.

TORNADO
Low Down Discharge.
Guaranteed to sow 50 per cent wider and more evenly than any in use. Perfectly Adjustable. Double Slides and Cut-Off.

The most perfect Machine now made. It is not attached to tail board of wagon, but is a complete Sower. Leaves no streaks behind wagon. Wastes no grain. Warranted superior to any. Send for circulars. Manufactured by
WHITMAN AGRIC'L CO., St. Louis, Mo.

Ask for Catalogue, Free.

THE NEW HUBER ENGINE

PLAIN ENGINES from 2 to 16 H. P.

THRESHERS of all sizes.

Has Patent Return Flue Boiler; Wrought Iron and Steel Wheels, with the Springs between the bearings of the Hub; 14-inch Steel Tire; Cushioned Gear and all Latest Improvements. 8, 12 and 16 H. P.
THE HUBER MFG. CO MARION, Ohio. 10 Spruce St.

3,000,000 WORDS!

The Equivalent of 50 Bound Books.

All Elegantly Illustrated, for only $2.

The New York *Ledger* gives a greater variety and larger quantity of high-class, interesting and beneficial home reading by the most eminent and popular writers than you can possibly buy in any other way for so little money. To be convinced of this statement send two dollars for a year's subscription, or send your name and address on a postal card to Robert Bonner's Sons, 353 William street, New York city, and a sample copy of the *Ledger* and our illustrated announcement for 1890 will be sent to you free.

Is your Watch worth A Dollar?

Then protect it from pickpockets by getting an
ANTI-PICKPOCKET SWIVEL (Patented Feb. 8, 1887.)
THE ONLY SAFEGUARD.
ALWAYS ON HAND. IN ORDER.
Only **$1.** Mailed postpaid on receipt of price.

You Want full particulars about the best watches made, our Keystone Dust-Proof and our mode of selling them at **$1** *a Week.* We guarantee you absolutely against loss. **Exclusive territory** given to **Active Agents.** Prices, **$7** to **$150.** Our special **$43** Watch is the best watch made for Railroad use. We guarantee our prices to be the very lowest at which any watches of equal quality can be sold, and we protect our customers fully. We refer to any commercial agency.

We have selling agents in every large city. We **want AGENTS everywhere.** Write at once to
THE KEYSTONE WATCH CLUB CO., 904 Walnut St., Philadelphia.

JOSEPH GILLOTT'S STEEL PENS.

GOLD MEDAL, PARIS EXPOSITION, 1889.

THE MOST PERFECT OF PENS.

A BEAUTIFUL (Stem Wind) Lady's or Cent's Hunting Case **GOLD** FILLED **WATCH $18.**
With **ELGIN, WALTHAM,** or **any American Lever Movement.** **Warranted** to wear well **20 Years** at least. Quality equal to what is sold at **$38** to **$40.** *Examination allowed before paying.* For further particulars, references, &c., that will pay you to have, write to **PENN WATCH CO.,** Manufacturers, **140 S. Third St., Philadelphia.**

AGENTS!! MEN!!! BOYS!!!

with experience are averaging $40 to $50 per week. | of no experience average $20 to $40. | of 15 to 18 years are making $2 to $5 per day.

with our new invention. It sells itself. Send 25c. in stamps for sample, or 2c stamp for circulars.
SAFETY FASTENING CO. 304 Vine St. Cincinnati, O.

SALESMEN WANTED AT ONCE.

A few good men to sell our goods by sample to the wholesale and retail trade. We are the largest manufacturers in our line in the world. Liberal salary paid. Permanent position. Money advanced for wages, advertising, etc. For full terms address, Centennial Mfg. Co., Chicago, Ill., or Cincinnati, O.

240 LB SCALE 500 lb Platform, $10; 1000 lb $15; 1500 lb $20; 2½ ton Wagon Scale, $40; 5 ton, $60. **List $3.00 FREE.** Am. Farm Scale Co., Chicago, Ill.

LADIES YOUR CHOICE. 100,000 DEMOREST CORSETS 100,000 SHOULDER BRACES 100,000 STOCKING SUPPORTERS FREE

A MARVELOUS OFFER
By A Reliable House!

Every lady has heard of MME. DEMOREST. Her name is a by-word in every house in the land. Her celebrated Patterns have been in use over 40 years. We are the publish.rs of the well-known publication,

Mme. Demorest's Illustrated Monthly Fashion Journal

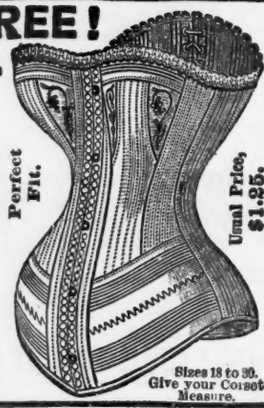
and we wish to increase its circulation 200,000 copies during the next 90 days, and to that end we will give away to new subscribers

100,000 Demorest Celeb'd Corsets " Shoulder Braces " Stocking Supporters **FREE**

The MME. DEMOREST ILLUSTRATED MONTHLY FASHION JOURNAL is a 36 page paper, beautifully illustrated, covering every possible field of **Fashions Fancy Work, Home Decorations, Cooking,** etc., each department being under the special supervision of the **best known contributors.** It is besides replete with matters of interest to **mothers,** and is furthermore filled with **illustrations, stories, sketches, humor** and matters of general interest.

FREE!

FINE AMERICAN JEAN! *Beautiful Ornamental Stitching.* Perfect Fit.



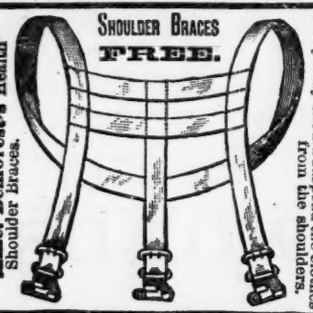
Usual Price, $1.25.

Sizes 18 to 30. Give your Corset Measure.

Every line of reading is carefully guarded by an editor, who receives $5,000 per annum, and nothing is published in its columns but the **best** and **purest reading matter.** It may be admitted to any household and your **children** may read it as well as you. It numbers among its subscribers **the wives of thousands of clergymen** throughout the country. It is the best **Fashion** paper published in the world. It tells you **"What to Wear" "When and How to Wear It."** It gives you all the latest styles in Ladies' Hats, Bonnets, etc. It is always abreast of the times, and everything within its pages is **new and original.** It also contains the latest Fashion news from abroad by our Special London and Paris correspondents.

Mme. Demorest's Health Shoulder Braces.

SHOULDER BRACES **FREE.**



Every lady should suspend the clothes from the shoulders.

HOW TO OBTAIN The Mme. Demorest Corset FREE

Send us **50 Cents for one year's subscription** to our JOURNAL and 25 cents additional to pay postage and packing, **75 CENTS** in all, and we will **mail** you one of these handsome **CORSETS FREE.**

STOCKING SUPPORTERS

How To Obtain Two Articles: A PAIR OF SHOULDER BRACES AND Stocking Supporters FREE

Send us **50 Cents** for one year's subscription to our JOURNAL, and 25 Cents additional to pay postage and packing, **75 Cents in all,** and we will mail you these two articles, **One Pair of SHOULDER BRACES** and **One Pair of STOCKING SUPPORTERS FREE!**

REMEMBER THERE IS NO HUMBUG ABOUT THESE OFFERS.

We do exactly as we guarantee. Our house has been established for over 40 years, and we can refer you to any Commercial Agency, Bank, Express Office or Business Firm in the land. Make all remittances either by Draft, Postal Note, Money Order, or Registered Letter. When postal note is not procurable, send stamps. Address all communications to

THE DEMOREST FASHION & SEWING MACHINE CO., 17 EAST 14th STREET, NEW YORK.

This offer should be taken advantage of at once as we will give away no more than 100,000 of each article. SHOW THIS TO YOUR FRIENDS. IT WILL NOT APPEAR AGAIN.

We know the Demorest Fashion and Sewing Machine Co. to be a thoroughly reliable firm and advise our readers to accept their offer.—EDITOR.

EVERY LADY WANTS A SILK DRESS.

This is your opportunity. **A new departure.** SILKS direct from the manufacturers to **you.** Our reduced prices bring the best goods within reach of all.

We are the only manufacturers in the U. S. selling **direct to consumers.** You take no risk. We warrant every piece of goods as represented, or money refunded. See our references. We are the oldest Silk Manufacturers in the U. S. Established in 1838, with over 50 years' experience.

We guarantee the

CHAFFEE DRESS SILKS,

for richness of color, superior finish and wearing qualities, to be **unexcelled by any make of Black Silks in the world.** We offer these Dress Silks in Gros Grains, Satins, Surahs, Faille Francaise and Aida Cloths, in Blacks only.

Send us a 2c.-stamp (to pay postage) and we will forward you samples of all our styles free with prices, and you can see for yourselves.

O. S. CHAFFEE & SON,
Mansfield Centre, Conn.

Refer, by permission, to First National Bank, Windham National Bank, Dime Savings Bank, Willimantic Savings Institute, of Willimantic, Conn.

RECOLLECT we send to all parts of the U. S. With each Dress Pattern we present the buyer with **1000** Yards Sewing Silk, and enough Silk Braid to bind bottom of dress.

THE GOODS are delivered to you all CARRYING charges **PREPAID**

PANTS MADE TO ORDER FROM YOUR OWN MEASURE.
$3. $4. $5.

SUITS from $12 up. OVERCOATS from $11 up.

GUARANTEED ALL WOOL. A PERFECT FIT. LATE PATTERNS.

and the Honest Fabrics of Thirty Years ago.

We Make the Cloth
We Take your Measure
We Make the Pants
} *We SAVE You* Three Profits

and **guarantee Better Garments** than the same money will buy elsewhere.

We can readily do this because (instead of scouring the market for odd lots and remnants) we buy the wool and convert it into the Pants you wear.

Samples, self-measuring rules, and a tape measure sent free We refer to Seventh Nat'l Bank, Philada. **Established 1825. DELAWARE WOOLEN MILLS** Office—N.W. Cor. Fourth & Market Sts., Philadelphia.

The Musical Year

New and True Music Books.

CHOICE SACRED SOLOS, 34 fine songs,.....$1.
CHOICE SACRED SOLOS, for Low Voice, 40 sgs. $1.
SONG CLASSICS, Soprano and Tenor, 50 songs,...$1.
SONG CLASSICS, Low Voice, 47 songs,.....$1.
CLASSIC BARITONE AND BASS SONGS, ..$1.
CLASSIC TENOR SONGS, 36 songs,.....$1.
CLASSIC VOCAL DUETS, the very best,.....$1
EVEREST'S ALBUM of SONGS, good selections.$1.
MAUD V. WHITE'S ALBUM, tasteful songs,...$1
SULLIVAN'S VOCAL ALBUM, a master's work, $1
POPULAR SONG COLLECTION, 37 good songs, $1.
GOOD OLD SONGS we used to sing, 115 songs,....$1.
COLLEGE SONGS, 150,000 sold,.....50c.
COLLEGE SONGS for **Banjo; for Guitar,** each, $1.
RHYMES & TUNES; Osgood. Sweet home music, $1.

INSTRUMENTAL.

PIANO CLASSICS, Vol. 1, 44 pieces,.....$1.
PIANO CLASSICS, Vol. 2, 31 pieces,.....$1.
CLASSICAL PIANIST, 42 pieces,.....$1.
POPULAR PIANO COLLECTION, 27 pieces,..$1.
POPULAR DANCE MUSIC COLLECTION,..$1.
YOUNG PEOPLE'S CLASSICS, 52 easy pieces,..$1

The above are all superior books.
Any book mailed for retail price.

OLIVER DITSON COMPANY, Boston.

C. H. DITSON & Co., 867 Broadway, New York.

Name on **25 Plush Floral Cards, 275 Pictures, Verses** and Games, **1 Ring, 1 Album., 1 Pencil and Book of Fringed Cards, 10c. Tuttle Bros., North Haven, Ct.**

PHOTOGRAPHY

With our complete equipments, is a paying business, and as a recreation, is both instructive and exhilarating. No previous knowledge of photography necessary. Process simple and sure. $50 per week easily made. Send 20c. for 8 page illustrated book, with full particulars and sample photos. Address SCHULTZE PHOTO EQUIPMENT CO., 5 Chatham Sq., New York. (Box Z).

FACIAL DEVELOPMENT.

Will mail you rules to develop muscles of cheeks and neck to make them plump and rosy, fully illustrated, for 50 Cents. Also rules for Dumbbells to develop every muscle of the limbs and body for 50 Cents additional, fully illustrated. Prof. D. L. DOWD, Scientific, Physical and Vocal Culture. (Address, School No. 26,) 9 East 14th Street, New York.

GOLDEN ROD IN COLORS!

We will send you this beautiful **Study of Golden Rod in Colors,** by LIDA CLARKSON, and a **three months' trial subscription** to **Ingalls' Home Magazine,** all for ten 2c stamps (20 cents). Have you seen

INGALLS' HOME MAGAZINE?

Single copies, 15c; $1 per year. It is a **finely-illustrated** monthly magazine of 64 pages, devoted to **Fancy Work, Art Painting, Domestic Helps,** etc. Send 20c for a three months' trial, and see how you like it. Address **J. F. INGALLS, Lynn, Mass.**

FREE NEW SAMPLE BOOK OF PHOTOGRAPH, ENVELOPE, Silk Fringe, and Hidden Name Cards, 867 Songs, Slight of Hand Tricks, Games and how to make $10 a day at home send 2c. for postage. CHAMPION CARD W'KS UNIONVILLE, O.

A NEW
TWILLED LACE THREAD
FOR CROCHETING.
BEST IN THE WORLD.

MAKES BEAUTIFUL LACE. Nos. 30, 40, 50, 60, white and ecru. SPOOL, **500** yards, 10 cents, postpaid. Crocheting Book, containing 59 Patterns and directions, 10 cents, postpaid. Buy of Dealer or order from us. Make address plain, including State.

GLASGO LACE THREAD CO.,
GLASGO, CONN.

Cheap Printing Do it yourself. Card press $3. Circular press $8. Size for a newspaper $44. Everything easy, printed rules. Send 2 stamps for catalogue of presses, type, &c., to factory. **KELSEY & CO. Meriden, Conn.**

"ACME" PULVERIZING HARROW, CLOD CRUSHER AND LEVELER.

AGENTS WANTED.

THE BEST SELLING TOOL ON EARTH.

Don't buy a base imitation or inferior tool. Order a Genuine Double Gang Acme

ON TRIAL,

to be returned at my expense if not satisfactory. No pay asked in advance.

ILLUSTRATED PAMPHLET FREE.

Sizes 3 to 12 ft. wide. With and without sulky.

I Deliver Free at Convenient Distributing Depots.

Steel Crusher and Leveler. Double Gangs of Adjustable Reversible Coulters. Lumps Crushed, Soil Cut, Lifted and Turned in one operation. No Spike or Spring Teeth to pull up Rubbish. No Wearing Journals. Practically Indestructible.

DUANE H. NASH, Sole Manufacturer, Millington, New Jersey.

☞Mention this Paper.

ASPINWALL POTATO PLANTER

Better than Ever.

PLANTS CORN

DISTRIBUTES FERTILIZERS

Absolute Guarantee given to do PERFECT AND RAPID WORK.

Write for illustrated circular. *Mention this paper.*

ASPINWALL MANUFACTURING CO.
THREE RIVERS, MICHIGAN.

THE CHAMPION COMBINED Feed Mill, CORN SHELLER —AND— COB SPLITTER.

Will shell 50 bu. per hour and grind from 10 to 20 with from 2 to 4-horse power. Special low prices to introduce them. Address

FOREST CITY MACH. WORKS, Cleveland, Ohio.

Superior to any other method because it *covers* every seed and all manure to the right depth. It increases the yield and saves seed.

Grain can be put in right on cornstalks or stubble without any plowing.

Quickly pays for itself.

Address

KEYSTONE M'F'G CO.,
STERLING, ILL.

THE "PLANET JR"

HORSE HOE has a world-wide fame, and its hosts of friends will be delighted with its **improvements** for **1890.** *First* **LEVER EXPANDERS** **Instantaneous** in **action, firm, strong, simple, accurate, perfect.** **HANDLE ADJUSTMENT** Sidewise and for height. Quick, stiff, grand for **grapes, corn** and in covering. **PARALLEL FRAME** Standards **interchangeable, STRONG, neat, CONVENIENT, inimitable.** We absolutely **guarantee** our **1890 Horse Hoe** and combinations, and new **patented features** to please every practical **farmer** and **gardener,** and their **money** value to be far greater than ever. Look at it, and write us. *Catalogue free.* The **"PLANET Jr"** Hand **SEED DRILLS, Double** and **Single Wheel Hoes; "Fire Fly" Plow,** &c., are indispensable to **farmers** and **gardeners.** They sow with regularity any thickness and depth, **diffident** and **easy seeds** in small or large quantity, and without **danger** to vitality and without special care. In market gardening the **Wheel Hoes** *save their cost every few days.* The **"Fire Fly"** Garden Plow is a delight in the family vegetable garden. The **"Planet Jr."** combined Seed Drill, Wheel Hoe, Cultivator and Plow combines in an admirable way the qualities of all the rest; being delightful as a **Seed Drill, Double Wheel Hoe** while plants are small, **Single Wheel Hoe, Cultivator**—deep or shallow, and **Garden Plow.** All the blades of these famous hand tools have long been made of hardened polished steel. Keep them bright and sharp, and you will **save the full cost every few days.** Send for full Descriptive Catalogue of all our goods. Write us your **wants.** **S. L. ALLEN & CO., Sole Manfrs., 1107 Market St., Philadelphia.**

IDEAL FEED MILL

AND **POWER COMBINED**

GRINDS ALL KINDS OF GRAIN including **EAR CORN** and **FURNISHES POWER** to run a Feed Cutter, Wood Saw, &c. at the same time. Catalogue showing a full line of Sweep and Belt Power Feed Mills, Corn Sheller, Feed Cutters, Horse Powers, &c., *free* by mentioning this paper.

STOVER MFG. CO., FREEPORT, ILL.

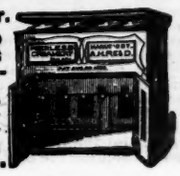
REID'S PEERLESS CREAMERY

Absolute Perfection for Best Quality Butter.

BUTTER WORKER

Also **CHURNS, POWER BUTTER WORKERS, PRINTERS, SHIPPING BOXES.**

Send for my Illus. Catalogue of **New and Valuable CREAMERY PLAN** and valuable information for Creamery men and Butter Factories.



CREAMERY SUPPLIES.

A. H. REID, 30th and Market Streets, PHILADELPHIA, PA.

$1.00 4 lb Family Scale, Brass Beam and Scoop. Worth $5. Chicago Scale Co., Chicago, Ill.

MATTERS OF BUSINESS.

The Crops of the Year.

The official statement of the great cereal crops of the United States in 1889, as published below from advance sheets of the Department of Agriculture report, indicate the largest crops on record with but few exceptions. The past year's crops complete a new decimal period, and make this comparison specially valuable; the figures representing bushels:

CROP YEAR.	CORN.	OATS.	WHEAT.
1880	1,717,434,543	417,885,380	498,549,868
1881	1,194,916,000	416,481,000	383,280,090
1882	1,617,025,100	488,250,610	504,185,470
1883	1,551,006,895	571,302,400	421,086,160
1884	1,795,528,000	583,628,000	512,765,000
1885	1,936,176,000	629,409,000	357,112,000
1886	1,665,441,000	624,134,000	457,218,000
1887	1,456,161,000	659,613,000	456,329,000
1888	1,987,790,000	701,735,000	415,868,000
1889	2,112,892,000	751,515,000	490,560,000
Average	1,703,437,053	584,395,839	449,695,358
Average '70-9	1,184,486,954	314,441,178	312,152,728

Detailed Statistics for 1889.

CORN.

STATES.	BUSHELS.	ACRES.	VALUE.
Maine	1,034,000	28,717	$589,273
New Hampshire	1,311,000	35,924	734,287
Vermont	2,044,000	58,397	1,124,142
Massachusetts	1,997,000	58,209	1,078,147
Rhode Island	3,393,000	12,558	220,116
Connecticut	1,766,000	56,977	953,795
New York	20,475,000	698,800	10,032,672
New Jersey	10,792,000	357,342	5,395,864
Pennsylvania	41,225,000	1,383,377	18,963,332
Delaware	3,905,000	223,136	1,640,050
Maryland	15,105,000	733,239	6,495,031
Virginia	34,231,000	2,152,911	15,061,765
North Carolina	33,050,000	2,754,127	17,516,248
South Carolina	18,310,000	1,592,152	9,887,264
Georgia	33,730,000	3,011,602	18,551,468
Florida	5,206,000	486,562	3,019,604
Alabama	33,944,000	2,514,370	17,311,437
Mississippi	29,474,000	1,991,481	14,736,960
Louisiana	18,949,000	1,082,826	9,664,222
Texas	83,698,000	4,573,645	29,294,196
Arkansas	42,608,000	2,130,399	18,321,431
Tennessee	80,831,000	3,674,140	29,907,500
West Virginia	15,199,000	678,518	6,079,521
Kentucky	75,382,000	2,844,601	25,629,855
Ohio	88,953,000	3,005,184	27,575,568
Michigan	22,737,000	967,513	8,412,526
Indiana	106,656,000	3,677,808	28,797,237
Illinois	259,125,000	8,022,454	62,190,063
Wisconsin	28,415,000	1,080,414	8,240,318
Minnesota	21,263,000	746,067	5,740,986
Iowa	349,968,000	8,859,898	66,493,534
Missouri	218,841,000	6,796,318	50,338,531
Kansas	240,508,000	6,813,251	43,291,397
Nebraska	149,543,000	4,097,067	25,422,301
California	4,464,000	158,288	2,544,322
Oregon	157,000	7,854	102,102
Colorado	1,092,000	42,993	633,373
Dakota	14,743,000	819,068	4,865,264
New Mexico	1,126,000	56,289	675,468
Utah	644,000	35,175	392,659
Total	2,112,892,000	78,319,651	$597,918,829

WHEAT.

STATES AND TER.	BUSHELS.	ACRES.	VALUE.
Maine	589,000	41,457	$588,689
New Hampshire	144,000	9,342	143,867
Vermont	325,000	19,675	308,406
Connecticut	30,000	1,934	27,579
New York	8,929,000	647,010	8,035,864
New Jersey	1,711,000	140,235	1,573,998
Pennsylvania	16,617,000	1,350,946	14,124,141
Delaware	1,100,000	94,790	879,651
Maryland	6,171,000	546,064	4,998,124
Virginia	6,804,000	810,057	5,851,852
North Carolina	4,492,000	724,473	4,042,560
South Carolina	1,191,000	198,454	1,131,188
Georgia	2,383,000	378,197	2,334,988
Alabama	2,502,000	357,377	2,451,606
Mississippi	494,000	75,938	488,661
Texas	6,189,000	600,837	4,579,580
Arkansas	1,794,000	236,008	1,524,612
Tennessee	9,085,000	1,211,394	6,904,946
West Virginia	3,144,000	308,251	2,609,653
Kentucky	10,811,000	982,831	7,784,022
Ohio	36,865,000	2,524,990	28,017,289
Michigan	23,709,000	1,612,847	17,544,550
Indiana	41,187,000	2,801,803	29,242,418
Illinois	38,014,000	2,375,863	26,609,666
Wisconsin	16,937,000	1,192,750	11,686,565
Minnesota	45,456,000	3,113,406	30,455,338
Iowa	21,023,000	1,604,838	13,244,728
Missouri	20,639,000	1,587,583	13,208,691
Kansas	30,912,000	1,680,000	17,001,600
Nebraska	16,848,000	1,404,019	8,761,079
California	43,781,000	3,291,820	30,646,844
Oregon	13,689,000	845,000	9,582,300
Nevada	335,000	18,306	251,250
Colorado	1,851,000	87,300	1,332,547
Arizona	337,000	25,930	252,818
Dakota	41,652,000	4,431,034	24,991,032
Idaho	1,449,000	81,427	1,116,039
Montana	1,539,000	85,000	1,153,875
New Mexico	1,096,000	86,295	800,041
Utah	1,880,000	122,878	1,410,025
Washington	6,856,000	415,500	4,799,025
Total	490,560,000	38,123,859	$342,491,707

OATS.

STATES AND TER.	BUSHELS.	ACRES.	VALUE.
Maine	2,764,000	94,025	$1,022,804
New Hampshire	956,000	31,359	363,451
Vermont	3,324,000	105,536	1,196,778
Massachusetts	646,000	23,750	245,480
Rhode Island	170,000	6,417	64,619
Connecticut	1,009,000	39,413	373,320
New York	36,009,000	1,384,967	11,522,925
New Jersey	3,408,000	144,425	1,158,866
Pennsylvania	34,504,000	1,316,932	10,351,085
Delaware	420,000	22,931	121,695
Maryland	2,203,000	117,786	660,779
Virginia	9,166,000	678,968	3,116,463
North Carolina	6,941,000	680,477	3,053,981
South Carolina	4,129,000	393,226	1,981,859
Georgia	6,874,000	624,874	3,436,807
Florida	568,000	54,081	295,283
Alabama	3,970,000	417,880	1,905,533
Mississippi	3,656,000	358,408	1,718,208
Louisiana	396,000	42,110	174,167
Texas	14,808,000	652,320	4,886,529
Arkansas	4,848,000	293,831	1,745,356
Tennessee	8,179,000	711,207	2,453,664
West Virginia	2,520,000	146,502	781,149
Kentucky	9,456,000	511,156	2,553,224
Ohio	36,615,000	1,169,823	8,421,556
Michigan	30,469,000	931,770	7,617,220
Indiana	27,317,000	968,688	5,736,570
Illinois	145,364,000	3,876,380	27,619,208
Wisconsin	52,697,000	1,527,437	10,012,350
Minnesota	53,128,000	1,562,588	10,625,598
Iowa	99,459,000	2,739,931	15,913,519
Missouri	36,384,000	1,426,839	6,549,191
Kansas	37,529,000	1,416,178	5,629,308
Nebraska	29,963,000	1,085,628	4,494,500
California	1,899,000	75,973	854,696
Oregon	5,432,000	211,371	2,118,572
Nevada			
Colorado	3,129,000	97,791	1,251,725
Arizona			
Dakota	23,290,000	1,245,428	6,288,166
Idaho	1,000,000	35,725	450,135
Montana	2,578,000	85,938	1,134,382
New Mexico	340,000	16,168	142,602
Utah	916,000	36,658	412,403
Washington	3,082,000	99,421	1,325,282
Wyoming			
Total	751,515,000	27,462,316	$171,781,008

Discussed in Detail.

Bench-Show of Dogs.—The fourteenth annual bench-show of dogs, under the management of the Westminster Kennel Club, will be held in the American Institute building, New York, February 11th to 14th.

A Salary, with expenses paid, will come handy to any one who is now out of employment; especially where no previous experience is required to get the position. If you want a position, see advertisement on page 101: "A Chance to Make Money."

A Map of the United States.—A large, handsome Map of the United States, showing North and South Dakota, mounted, and suitable for office or home use, and issued by the Burlington Route, will be furnished responsible parties free on application to the undersigned, P. S. Eustis, Gen'l Pass. and Ticket Agent C., B. & Q. R. R., Chicago, Ill.

Handsome and Cheap.—A well-made, richly-upholstered parlor set of furniture for less than thirty dollars. This is the advertised offer made by the Murray Manufacturing Company, of Cincinnati. The company has been selling carriages and harnesses of such qualities and prices as to paralyze the trusts and combines. Now it has entered the field with furniture. The advertisement of this company on another page is well worth perusal.

The Vienna Exposition.—The Agricultural and Forestry Exposition, to be held in Vienna, from the middle of May to the middle of October next, promises to be second only to the Paris exposition of last year, in attractiveness. All the European nations, from Norway to Italy, have signified their hearty coöperation. Many of the features which lent brilliancy to the great Paris show, including the illuminated fountains, are to be reproduced in the gay Austrian capital.

Good Seeds.—Johnson & Stokes, the well-known seed-growers, have issued their garden and farm manual for 1890. It is finely printed and illustrated, giving, besides all the standard sorts, authentic descriptions of many rare novelties and valuable specialties for market gardeners. It will be mailed, together with a packet of seeds of the fine, new cabbage "All Year Round," a variety equally good for spring, summer, autumn or winter, to any of our readers who send ten cents, in postage stamps, to Johnson & Stokes, Philadelphia, Pa.

Grass-Cutting Machinery.—In the northwestern part of the old limits of Chicago has grown up quite a little city of itself, which is locally known as "Deering," for it consists wholly of the shops, lumber-yards, and laborers' cottages of the Deering Harvester works. Here are made the unsurpassed Deering machines for harvesting grass and grain. The former include the New Deering Mower, the Front-cut Giant Mower (five, six, and seven-foot cut, with weed-cutting attachment), and the Deering one-horse Mower. These comprise everything in this line that any farmer can desire, and the utmost skill has been used to make each machine the best of its kind. Send for free catalogue to William Deering & Co., Fullerton and Clybourne Avenue, Chicago.

Wire and Picket Fence.—The fences made of pickets and wire possess all the advantages of the old-fashioned picket fence, at greatly reduced cost, and increased durability. They are rapidly constructed, strong, neat, cheap, and any defective or broken picket may be replaced, without disturbing the rest of the fence. Every one who contemplates building a fence will do well to send to S. H. Garrett, Mansfield, Ohio, for free catalogue of fence machines, and all the requisites for fence building. With the machine and accompaniments every farmer can build his own fences.

The Maple Tree Scale.—O. P. Mercer, Kings Co., N. Y.: The article on "The Maple Tree Scale" in Brooklyn, given in the AMERICAN AGRICULTURIST for August, appears to have attracted considerable attention, especially in our sister city, where the pest named is destroying many thousands of trees. The author of the said article (Mr. A. S. Fuller) has prepared, at the request of the Board of Parks of Brooklyn, an illustrated pamphlet—for free distribution in that city—in which a full description of the insect and the best known remedies and mode of destroying the pest are given.

The Farmers' League.—This is an "independent, non-partisan organization," that aims to enable farmers to coöperate politically in securing such practical reforms as they desire in Legislatures or in Congress. The League is made up of local, county, State, and National branches. It plans to effect a practical league of all existing farmers' organizations, without infringing upon their individuality. The leading officers of the National Branch are: President, George T. Powell, Ghent, Columbia Co., New York; secretary, Herbert Myrick, Springfield, Mass.; treasurer, Walter P. White, Putnam, Conn.

Planting Potatoes.—The results of the AMERICAN AGRICULTURIST Prize Crop Competition last year proved conclusively that the way to plant potatoes for big crops is in drills. For this purpose the Aspinwall Potato Planter is admirably well adapted. Moving as fast as two horses can walk, it opens the furrow, drops the seed with unerring certainty at any desired distances, and covers it to a uniform depth. Furthermore, a fertilizer attachment may be used with it, if desired. The same machine may be changed to plant corn. It is made by the Aspinwall Manufacturing Co., Three Rivers, Michigan.

The Fence Problem.—While the United States government is throwing open to cultivation millions of acres of Indian reservations, the farmers are adding thousands of other acres to the available area by the removal of old, rotting, weed-encumbered rail fences. A perfect fence to replace the old, is McMullen's Woven Wire Fencing. It is made of wire netting of any desired size of mesh, with a strong selvage of twisted wire. It is cheap, strong, will not injure stock, burn down, or shade the ground. It is now largely used on the great breeding farms for fencing and corrals. Made by the McMullen Woven Wire, Co., Chicago.

Better and Cheaper.—The recent change in the form of the *New York Ledger* was accompanied by a notable change in both the contents and the price. In place of the eight large pages it is now issued in a compact, elegant form of sixteen pages. Instead of being filled with long stories "to be continued" its columns are brilliant with articles of value and interest, from the pens of the best writers. The paper is of better quality than before, and the illustrations finer and more artistic; yet with all these improvements the price has been reduced from three to two dollars a year. The *Ledger* is, more than ever, the favorite of those who love pure, good literature.

Notice to the Trade.—We have this day purchased of the assignees of the estate of B. & J. W. Belcher, all the patterns, machinery, stock, good will, etc., belonging to said firm and of their predecessors, Whittemore, Belcher & Co. We shall manufacture their line of goods at the shops recently occupied by them, which we have leased, and are prepared to fill orders for all goods and parts for same formerly made by them. The business will be conducted under the firm name of Taylor & Gale, to whom all letters should be addressed, and who will be pleased to receive your orders for all goods manufactured by them. The Belcher & Taylor Agricultural Tool Co., Chicopee Falls, Mass., December 17, 1889.

Horses and Cattle.—Percheron Horses—French Coach Horses—Shetland Ponies—Holstein Cattle and high grade horses. Savage & Farnum have them at the Island Home Stock Farm, Grosse Isle, Wayne Co., Mich., and will give purchasers special bargains. Write, describing what you want and they will present facts and figures that will convince you that they can and will make it advantageous to visit them. Owing to certain changes to be made in their business early the coming spring, they will dispose of all their live stock during the next three months. Intending purchasers should not fail to send for their catalogue. Address Savage & Farnum, Detroit, Mich.

Royal Approval.—In its report of the great Birmingham (England) cattle-show, a Birmingham

(*Continued on Page* 105.)

'Tis but your due when you exact For every step you take, a fact.

In this way you won't go wrong.

You are entitled to assurance, especially if you are sick, and you will be foolish not to insist upon it.

When Drs. Starkey & Palen invite an invalid to examine their record, they ask attention to something worth looking at.

For 20 years their Compound Oxygen Treatment has been curing desperate diseases, and during that time thousands have used it.

A book of 200 pages, free to you, gives the names and addresses of men and women restored to health by this agency.

These men and women whom Drs. Starkey & Palen have cured, gratefully admit that such is the case, and this book is filled with such testimonials as the following:

DRS. STARKEY & PALEN:
I know that your Compound Oxygen is a great thing for *weak lungs*; also, for *rheumatism*.
MRS. EDWARD C. THAYER.
Keene, N. H., July 25, 1889.

DRS. STARKEY & PALEN:
I used your Compound Oxygen for an *abscess on the lungs*. My friends and physicians said I must die, but your Compound Oxygen Treatment made me well again, and I feel entirely recovered. It seems almost like a miracle.
Pembroke, Ky., June 25, 1889. J. R. PENICK.

DRS. STARKEY & PALEN:
Your Compound Oxygen Treatment has done much for me. My *lungs* are sound now.
MRS. ELLA HARRINGTON.
Nevada, Mo., July 28, 1889.

DRS. STARKEY & PALEN:
Some years ago I used your Compound Oxygen Treatment for my *lungs*, which were in a bad condition. I was rapidly cured, and am a well man now.
F. M. MCCLINTOCK.
Union City, Pa., August 10, 1889.

DRS. STARKEY & PALEN:
I suffered with a very *sore throat*, but your Compound Oxygen Treatment brought it round all right again.
MRS. JOS. M. KARNS.
Cooperstown, Pa., August 10, 1889.

The 200-page book, to which reference has already been made, is filled with evidence. Testimonials from men and women restored to health by the use of the Compound Oxygen Treatment.

There is not only plenty of evidence, but it is evidence of weight, in this book.

In its pages may be found the indorsements of the late T. S. Arthur, the well-known author of "Ten Nights in a Bar-Room," Mrs. Mary A. Livermore, the noted advocate of the temperance cause, the Hon. H. C. Griffith, Hon. Wm. Penn Nixon, editor of Chicago Inter-Ocean, Bishop Benade, Bishop Castle, Dr. Darby, president of Columbia (S. C.) Female College, and many others equally well known.

The book will be sent entirely free of charge to any one addressing DRS. STARKEY & PALEN, No. 1529 Arch Street, Philadelphia, Pa.; No. 120 Sutter Street, San Francisco, Cal.; 58 Church Street, Toronto, Canada.

One strong reason why Drs. Starkey & Palen have been so successful with the Compound Oxygen Treatment, is the fact that in addition to being experienced physicians, they are expert chemists.

They demonstrated to their own satisfaction that the Compound Oxygen Treatment could be stored in healing and vitalizing proportions, and they proved it to the satisfaction of their patients.

Dr. Starkey developed this treatment to meet an emergency in his own case; an emergency so serious that all ordinary remedial means failed to measure to it.

The result was his complete restoration to health.

This is a splendid basis to start from when the relief of invalids is the end in view.

It makes everything seem hopeful. It is hopeful—observe:

DRS. STARKEY & PALEN:
I have all confidence in your Compound Oxygen Treatment *for throat and lung troubles*, having been much benefited by its use. MISS MARY SNOWDEN.
259 S. Factory St., Springfield, Ohio.

DRS. STARKEY & PALEN:
I have suffered for years with a stubborn throat disease, and had *hemorrhages of the throat*.
Since using your Compound Oxygen Treatment I have improved steadily One year ago my friends gave me up to die; now some of them believe with me that your Compound Oxygen Treatment saved my life.
FRANCIS MORSE.
Amherst, Mass., Feb. 8, 1889, formerly Auburn, N. Y.

DRS. STARKEY & PALEN:
When suffering from *throat trouble* a few years ago, I used your Compound Oxygen Treatment with good and lasting results. My general health was also much benefited. M. L. MORROW.
Chester, Pa., Feb. 13, 1889.

DRS. STARKEY & PALEN:
Eight years ago I was making frequent reports to you, but thanks to your Compound Oxygen Treatment I have no report other than continued good health to make.
The weakness of my lungs, which resulted from the terrible *hemorrhages* of two years before, was completely cured by your Compound Oxygen Treatment, and no indications of any further difficulty have manifested themselves
I think I owe my life, certainly my good health, to your Compound Oxygen Treatment. CHAS. S. WEBB.
Oshkosh, Wis., March 6, 1889.

The book of 200 pages contains page after page of such evidence as the above.

Enough to make any sick man take heart again.

It will be sent entirely free of charge to any one who asks for it.

The Compound Oxygen Treatment has been used in over 55,000 cases by physicians and invalids.

Over 1000 physicians use it in their practice now.

The Compound Oxygen Treatment is a grand specific for consumption, asthma, catarrh, bronchitis, hay fever, headache, rheumatism, neuralgia, and all complaints of a chronic nature.

Address DRS. STARKEY & PALEN, No. 1529 Arch Street, Philadelphia, Pa.; 120 Sutter Street, San Francisco, Cal.; 58 Church Street, Toronto, Can.

Make a personal application of the matter:

You have in hand something that you know, from positive, personal experience, is exactly what you represent it to be.

In addition to that strong point, you have witnesses by the thousand to prove that you are telling the truth.

Wouldn't you feel discouraged, if you failed, with all this evidence, to make your claim good?

But such is not likely to be the result; when you work from such a basis you will not fail to get a hearing.

This is the case with Drs. Starkey & Palen, precisely.

Their Compound Oxygen Treatment has cured invalids of desperate diseases for more than 20 years, and these restored men and women gladly testify to that blessed fact. Observe:

DRS. STARKEY & PALEN:
I wish every sufferer who has *asthma* could use your Compound Oxygen Treatment.
MRS. CHAS. TERRELL.
Water Mills, N. Y., March 24, 1889.

DRS. STARKEY & PALEN:
Being a great sufferer from *asthma* some four years ago, I ordered a Home Treatment of your Compound Oxygen from you, which greatly benefited me, and had I continued taking it for a few months I am confident it would have made a permanent cure.
I heartily recommend it to all asthmatics as a positive cure. MRS. M. VOSS.
Livingstone, Ala.

DRS. STARKEY & PALEN:
I preach your Compound Oxygen Treatment to all I meet who are afflicted as I have been with *asthma*.
MRS. PAUL E. HATHAWAY.
10 Spring St., New Bedford, Mass.

A 200-page book, free to you will give you the names and addresses of men and women restored to health by the use of this treatment. Not a few instances, but page after page of them.

The book contains the indorsement of many prominent physicians, ministers, bishops, college presidents, and others widely known.

It has a good influence upon the discouraged invalid. It makes him take heart again, for this unmistakable inference is there as plain as day: If all these diseased men and women recovered, so may I.

So you may.

It's worth while investigating, and the material upon which you may form a judgment will be forwarded to you entirely free of charge—a 200-page book and a quarterly review.

You are not argued and persuaded into this matter, but are permitted to use your own good judgment.

You cannot help being impressed with the tremendous weight of evidence in the pages of this book.

And it is not only evidence of weight, but it is evidence of character.

Testimonials from men and women known throughout the country. Send for the book; it will be forwarded to any one addressing DRS. STARKEY & PALEN, No. 1529 Arch Street, Philadelphia, Pa.

A GLORIOUS FLOWER

THE "OSTRICH PLUME"

Mrs. Alpheus Hardy CHRYSANTHEMUM.

No engraving can do justice to the unique and peerless beauty of this new Chrysanthemum. Imagine plants completely studded with balls of flowers one foot in circumference, whose petals curve gracefully inward, and which in turn are dotted with a peculiar hairy-like growth, the whole resembling, more than anything else, masses of **Snow-White Ostrich Plumes,** and you then begin to form some idea of the beauty of this royal flower. Your garden will not be complete this season if it does not contain the *"Ostrich Plume" Chrysanthemum.* (Instructions for culture with each order.)

PRICE.—Fine plants, certain to bloom, 40 cts. each, three plants for $1; seven for $2; twelve for $3. Free by mail.

☞ With every order for a single plant or more will be sent, gratis, our superb Catalogue of "EVERYTHING FOR THE GARDEN" (the price of which is 25 cents), on condition that you will say *in what paper you saw this advertisement.* Club orders for THREE, SEVEN or TWELVE plants can have the Catalogue sent, when desired, to the separate address of each member comprising the club, provided always that the paper is named. ☜

PETER HENDERSON & Co.
35 & 37 CORTLANDT ST. NEW YORK

OUR NEW
SEEDS FREE SEEDS
CATALOGUE
—ON—
APPLICATION.
NEW Novelties,
Choice Grown.
SEEDS Higganum Mfg. Corp. SEEDS
P. O. Box 376, N. Y. City.

SEEDS.

My Annual PRICED CATALOGUE is now ready and mailed free to all applicants. It contains all the leading and most popular sorts of

Vegetable, Farm,
—AND—
Flower Seeds,

besides all the desirable novelties of last season, and nearly everything else in my line of business.

ALFRED BRIDGEMAN, 37 E. 19th St., N. Y. City.

THE WONDERFUL TOMATO.

The new "Giant Seedling." Single tomatoes weighing 46 ounces, and up to 20½ inches around. **Not one of the hundreds** who saw them growing went away without securing seed. Sworn certificates of examining committee. Testimonials from 10 prominent citizens. Excellent quality. Wonderful bearers. Early ripeness. Send Postal for description. Seed for 5 bushels, 25c silver.

DAVID LOGAN, Meadville, Pa.

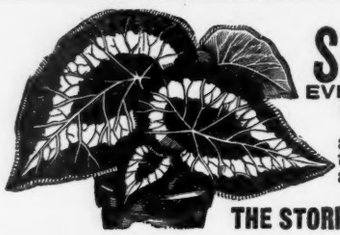
TREES FOR WINTER PLANTING
ROSES, GRAPES, Etc.

In order to meet the demand for **Trees,** &c., from sections of the country where the climate will permit of their being planted during the winter months, we have placed in our storage houses a complete collection of nursery stock, and can ship at any time. **ELLWANGER & BARRY,** MOUNT HOPE NURSERIES, ROCHESTER, N.Y. CATALOGUE FREE

VICK'S SEEDS PLANTS

FLORAL GUIDE FOR 1890, the Pioneer Seed Catalogue of America, contains complete list of Vegetables, Flowers, Bulbs, Potatoes and Small Fruits, with descriptions and prices. Same shape and style as proved so satisfactory last year. Many new and elegant illustrations handsome colored plate 8 x 10½ inches, and frontispiece. **Special Cash Prizes $1000.00; see Floral Guide.** Every person who owns a foot of land or cultivates a plant should have a copy. Mailed on receipt of 10 cents, which amount may be deducted from first order. ABRIDGED CATALOGUE FREE.

JAMES VICK, SEEDSMAN, ROCHESTER, N.Y.



SEEDS

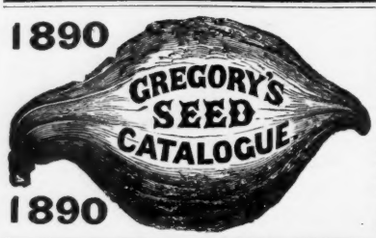
Plants, Roses, Shrubs, Fruit and Ornamental Trees, Grape Vines, Small Fruits etc.

EVERYTHING IN THE NURSERY LINE.
RAREST NEW. CHOICEST OLD.

Send ten cents for our illustrated catalogue of about 150 pages, containing a certificate good for ten cents in seeds, etc. Or send for our 32 page abridged catalogue and price-list **free.**

36 years. 24 greenhouses. 700 acres.

THE STORRS & HARRISON CO., Painesville, Ohio.



THE PUBLIC WANT their seed fresh and true. Would they not be most likely to obtain such by buying **directly from the grower?** I can buy seed at half what it costs me to raise it, but could not sleep sound should I warrant seed of this class. For the same reason I make special effort to procure seed stock directly from their originators. You will find in my new seed catalogue for 1890 (sent **free**) the usual extensive collection (with the prices of some kinds lower than last season) **and the really new vegetables of good promise.** You should be able to get from me, their introducer, good seed of Cory Corn, Miller Melon, Hubbard Squash, all Seasons and Deep Head Cabbages, and many other valuable vegetables.

JAMES J. H. GREGORY, Marblehead, Mass.

HUNTSVILLE WHOLESALE NURSERIES.

The largest nursery of Fruit Trees in the world. EXCLUSIVELY WHOLESALE. To Nurserymen, Dealers, and Market Orchardists. IMMENSE STOCKS of Pears, Plums, Cherries, Peaches, Apricots, Nectarines, Almonds and Quinces. **Varieties suitable to all latitudes.** SPECIALTIES: Lawson, Kieffer, Le Conte, Early Harvest and Seckel Pears; Russian Pears, including Bessemianka, Gakovska, and No. 1401; Russian Apricots and Cherries; De Soto, Wolf, P. Simoni, Kelsey, Botan and Blood Plums; Peen To and Honey Peaches and their improved seedlings. Other new and famous sorts. **Quick transit, in through cars, free of freight charges,** *to St. Louis, Mo., Cincinnati, O., Rochester, N. Y., Philadelphia, Pa., Dallas, Tex., Jacksonville, Fla.* We can refer to customers in every State and Territory. Prices very low. Price List free. Address **W. F. HEIKES, Manager, Huntsville, Alabama.**

JERRARD'S SEED POTATO CATALOGUE

MY **SEED POTATOES** are grown from the Choicest Stock, in the virgin lands of the cold North-East. I have the best New and Standard Sorts, and warrant them superior to all others for seed. I raise my **SEED CORN** 150 miles Farther North than the North line of Vermont, and for Early Crops my **CARDEN SEEDS** have no equal.

I offer this season my new **HARBINGER POTATO,** which I believe will be the Great Market Potato of the future. And my new **EARLY BRYANT CORN,** a handsome yellow variety, the Earliest of All. I have Special Low Freight Rates everywhere. My fine new Catalogue Mailed Free. ☞ Name this Paper and address

GEORGE W. P. JERRARD, Caribou, Maine.

We claim to be one of the largest growers and importers of Flower Seeds in America. In order to introduce them as widely as possible we make this **UNPRECEDENTED OFFER. For 25c.** in postage stamps or money we will send by mail one pkt. each of the following Valuable Seeds: **New Diamond Aster,** very handsome colors; **Mixed Balsams,** immense size, double as a rose; **Calliopsis,** Golden Wave, new, very showy; **New Hybrid Caillardria,** unrivaled for beauty; **Phloxdrumundii Grandiflora Splendens,** 15 distinct shades; **GIANT SHOW PANSIES,** immense size, rich and velvety; **New Mammoth Verbena,** 12 choice colors; **New Giant Zinnia,** largest in the world; **10 Seeds of ANNUAL NUTMEG PLANT,** great value, never before offered; **Amaranthus Gibbosus,** highly ornamental; one **Beautiful Everlasting Flower,** if full-size pkts., with directions for culture, for 25c.. 6 Collections, **$1.00.** Catalogue with each order. **SAMUEL WILSON, Mechanicsville, Bucks Co., Pa.**

NEW STRAWBERRY "LADY RUSK"

The best berry for long distance shipments. Will not rot or melt down if packed dry. Headquarters for all leading varieties of Berry Plants and **GRAPE VINES** having 300 acres in cultivation. **Catalogue free.**

WM. STAHL, Quincy, Ill.

BURPEE'S BEST SEEDS

FARM ANNUAL (WB)

handsomely illustrated with **colored plates painted from nature,** tells all about the **RARE NOVELTIES** of sterling **merit,** including which cannot be obtained elsewhere. It is mailed **FREE** to all who want really first-class *Warranted Seeds.*

W. ATLEE BURPEE & CO., Philadelphia, Pa.

SEEDS GIVEN AWAY!

Reader, if you love flowers, here's a treat for you. Send 10 cents for **Park's Floral Guide,** a handsome annual, abounding with fine engravings, rich-colored illustrations and cultural notes, and with it we will send
1 package **Mixed Flower Seeds,** over 500 kinds, yields an astonishing variety of flowers, all sizes, forms, colors, annual and perennial, 10 cts.,
1 P'k'g **New Shirley Poppy,** true, a grand novelty, mixed colors, 20 cts
1 **Certificate** or Order for Seeds or Bulbs, your choice, - - - - 25 cts.
1 **Sample Copy Park's Floral Magazine,** an elegant monthly, 5 cts.
All the above worth 60 cents, mailed with **Park's Floral Guide** for only 10 cents. They will delight you. Send 10 cents at once and tell your friends to send. Don't wait. This notice will not appear again. Address
G. W. PARK, Parkton, Metal P. O. Pa.

P. S.—**Park's New Rose Budget,** all about Roses, superbly illustrated, only 25 cents. Send for it also

FAY CURRANT HEADQUARTERS GRAPES LARGEST GROWER OF GRAPE VINES IN AMERICA

NEW GRAPES, ESTHER (white), and **ROCKWOOD** (black), originated by **E. W. BULL,** originator of the **CONCORD GRAPE.** Also **EATON, MOYER,** and all others, new and old. Best and Cheapest. Small Fruits. Free Catalogues. **CEO. S. JOSSELYN, Fredonia, N.Y.**

GRAPE 850,000 100 VARIETIES VINES

Headquarters of the **MOYER,** the Earliest, Best, Reliable Red Grape. Also **SMALL FRUITS, TREES,** etc. 5 sample vines mailed for 15 cents. Illust. descriptive Price List free. **LEWIS ROESCH. FREDONIA, N. Y.**

THE EARLIEST TOMATO IN THE WORLD FOR 2 CTS.

Also a **FREE** copy of our catalogue for 1890 of **NORTHERN GROWN SEEDS,** the handsomest we have ever published, containing all the **LATEST NOVELTIES** and **GOOD THINGS** for the Garden and Farm. **Send now!** this offer will not appear again.
Norlhrup, Brasian & Goodwin Co., Minneapolis, Minn.

THE BEST SEEDS

are those put up by

D. M. FERRY & CO.

Who are the largest Seedsmen in the world.

D. M. FERRY & Co's Illustrated, Descriptive and Priced

SEED ANNUAL

for 1890 will be mailed **FREE** to all applicants, and to last season's customers. It is better than ever. Every person using *Garden, Flower or Field Seeds* should send for it. Address

D. M. FERRY & CO. DETROIT, MICH.

600 ACRES. 13 GREENHOUSES.

TREES AND PLANTS

We offer for the **Spring** trade a large and fine stock of every description of **FRUIT** and **Ornamental TREES, Shrubs, Roses, Vines, SMALL FRUITS, Hedge Plants, Fruit Tree Seedlings** and **Forest Tree Seedlings.** Priced Catalogue, **Spring** of 1890, mailed free. *Established* 1852.

BLOOMINGTON (PHŒNIX) NURSERY

SIDNEY TUTTLE & CO., Proprietors, BLOOMINGTON, ILL.

SEEDS Johnson & Stokes'

GARDEN AND FARM MANUAL FOR 1890.

Is the best published. Brimful of good things, crowded with illustrations from Nature, and the choicest list of rare and valuable novelties ever offered. On receipt of **10 cents** in cash or stamps we will mail it, together with a large packet of our **new cabbage ALL YEAR ROUND.** By far the **Best Cabbage** ever introduced for early, intermediate and late, catalogue price of which alone is *20 cents.*
Market Gardeners write for Special Prices. Mention this paper

JOHNSON & STOKES, 217 & 219 MARKET STREET, PHILADELPHIA, PA.

PURE FRESH SEEDS

Warranted to grow and give **Satisfaction.** Buy your **Seeds** direct from the **Growers. Prices the Lowest.** Pkts. **5 cts. Free Seeds** with all orders. Send for beautiful **Lithographed colored Catalogue, sent FREE. Market Gardeners,** send for **Wholesale Price List.**

ALNER BROS., Rockford, Ill.

John Saul's Washington Nurseries.

Our Catalogue of **New Rare** and **Beautiful Plants for 1890** will be ready in February. It contains a list of all the most beautiful and rare greenhouse and hot-house plants in cultivation, as well as all novelties of merit, well grown, and at very low prices. Every plant-lover should have a copy.

Orchids.—A very large stock of choice East Indian, South American, etc. Also Catalogues of Roses, Orchids, Seeds, Trees, etc., all free to applicants.

JOHN SAUL, Washington, D. C.

NORTHERN GROWN **TREES AND PLANTS**

Always on hand a finely assorted, large stock of **Best** varieties—new and old—Grape Vines, Fruit and Ornamental Trees, Small Fruit Plants, Garden and Flower **SEEDS.** All stock warranted. Write for *Free* Catalogue. **Agents** wanted. Special inducements offered.
COE & CONVERSE, Fort Atkinson, Wis.

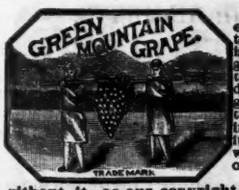
Wonderful New Fruits. It is an acknowledged fact we have introduced the best **new fruits** sent out. We, this year as usual, have something no one else has; our **new catalogue** will tell you all about them. **Free** if you are a subscriber of this journal.

CLEVELAND NURSERY CO., Lakewood, O.

FREE TO ALL.

Send your address immediately, on postal card, **for our 80-page elegantly Illustrated Catalogue, describing more than 300 of our Works pertaining to Rural Life.**

ORANGE JUDD CO., 751 Broadway, N. Y.



This grape originated in the Green Mountains of Vermont. It is very early; color, greenish white; pulp tender, sweet and delicious. The only grape yet introduced that ranks first, both in earliness and quality. Each vine sold will be sealed with our Trade-Mark.

None genuine without it, as our copyright name "GREEN MOUNTAIN" gives us the exclusive right for its propagation for sale. Send for Circular giving further information. Address

STEPHEN HOYT'S SONS, New Canaan, Ct.

Send ten cts., before **Mar. 1,** for my new Seed Catalog (which contains an *Elegant Colored Plate of Rare Blue and Pink Water Lilies,* and tells how to bloom them in tubs in open air, *4 months from sowing seeds*), and I will mail you 5 sample papers flower seeds, my choice, for trial, *free.* **For 30 cts.** I will send all the above and 7 more papers, *Improved Sweet Williams,* 48 vars., mixed; *Gypsophilia or Mist Flower; Double Portulaca,* 10 cols.; *New Godetias,* 8 vars.; *Improved Double Poppies,* 36 vars.; *Giant White Candytuft; Double Asters,* 35 vars. **For 50 cts.** I will send Catalog and 20 papers, all the above and 8 more, *amounting to $2 at regular rates,* viz.: *Large S. Phlox, Pansy Park Prize Strain,* 30 vars.; *Dwarf Sweet Alyssum; German Pansies,* 50 vars.; *Annual Chrysanthemum; New Amaranthus Splendens; Double Gaillardia,* 8 vars.; *Japan Pinks,* 50 vars.; *Double English Daisies,* 8 vars. **18 First Prizes** awarded me on above strains by Mass. Hort'l Soc. **Euphorbia Heterophylla** *the New Mexican Fire Plant, or Painted Leaf,* is the most elegant of all annual foliage plants; 3 feet tall, very branching, leaves 3 inches long, dark green, those on the ends of branches in clusters and *blotched with scarlet.* **Ipomœa Setosa** *the new Brazilian Morning Glory or Day-blooming Moon Flower* is the most ornamental of all annual vines, climbing 40 feet with immense leaves—often a foot across—covered with reddish hairs; flowers 3 inches across, rosy pink, borne freely in large clusters. **GREAT SPECIAL OFFERS!**

The Catalog price of these *genuine new plants* is 50 cts., but I will send a pkt. of both **absolutely free** to all who order the above 50c. lot or will add a pkt. of *Fire Plant,* gratis, to each 30 ct. order.

L. W. GOODELL, Seed Grower, Pansy Park, Dwight Mass.

DELICIOUS FRUITS

For ORCHARD and GARDEN.

Beautiful Ornamental Trees, Evergreens, Shrubs, Roses, Hardy Plants, etc., for parks, public grounds and gardens. The **largest** and **most complete stock** in the U. S. New illus. and descriptive priced **Catalogue,** containing important information for planters, **FREE**

ELLWANGER & BARRY, Mt. Hope Nurseries, ROCHESTER, N. Y.

SEEDS! GARDEN, FLOWER and FIELD.

Seed Potatoes, Fruit Trees and **Plants** in great variety. **Our Free Catalogue,** *a Novelty* in these days of *Exaggeration* and *Bombast,* that all should have, *as it gives* **Accurate Descriptions,** and **Fair Prices** for best goods. **We Aim to Please** *and Seldom Miss.* **FRANK FORD & SON, Ravenna, Ohio.**

A CHANCE TO MAKE MONEY.

Salary and Expenses paid, or Commission if preferred. Salesmen wanted everywhere. No experience needed. Address, stating age,
H. W. Foster & Co., Nurserymen, Box M, Geneva, N.Y.

FREE

Prettiest BOOK ever Printed.

SEED ONE CENT A PACKAGE, and

up, per rarity, scarcity, or cost. 1 000 000 extras. Cheap as dirt by oz. & lb. Send your address.
R. H. Shumway, Rockford, Ill.

WONDERFUL NEW FRUITS.

Globe, Ford's Late, White and Wonderful **Peach,** Jessie, Pineapple and Cloud **Strawberries;** all kinds of **Fruit Trees** and best **Small Fruits** at **Fair View Nurseries.** Established 1835. Oldest in the State.

Catalogue and price list free.

C. H. PERKINS, - Moorestown, N. J.

REID'S SMALL FRUITS TREES, VINES, SEEDS, Ornamentals, Crates and Baskets.

Everything for the fruit grower, *Prices Low, Estimates Free.* You save one half by seeing our list. **New Fruits a Specialty.** "*The Truth About New Fruits*" with *Illus. Catalogue,* **Free. E. W. REID, Bridgeport, Ohio.**

GRAPE Vine Niagara, or Flowering Hydrangea, and $5 000 Catalogue, all for 10 cents. GREEN'S NURSERY CO., Rochester, N. Y.

To create an appetite, and give tone to the digestive apparatus, use Ayer's Sarsaparilla.

ANIMAL AILMENTS.

Bruised Wounds require fomentation with cloths wrung out of warm water, or warm poultices. To make a soft, emollient poultice, pour sufficient boiling water on a mixture of equal parts of wheat-bran and flaxseed-meal, to make it thick, soft, and moist, but not dripping.

A New Butter Separator.—The latest foreign dairy invention is a machine devised by Laval, the inventor of the centrifugal separator. It combines in the one machine a cream separator and churn. The cream, as it is separated from the milk, passes through a refrigerator into the churn itself, when it is there made into butter. It is claimed for this machine that it is more simple than the butter separator already in use in this country.

Torn Wounds are more dangerous, as a rule, for they heal slower and by the process of suppuration, while cut wounds, if soon and properly drawn together, heal quickly. These come from carelessly exposed nails, hooks, pins, kicks, sharp horns, and many other causes. They should be cleansed with warm water, and dressed with several folds of cotton cloth dipped in pretty warm water. All sick animals, as well as those injured, should be kept quiet in a dark stall. Animals accustomed to be tied, keep more quiet when tied up short and high, thus preventing lying down, which of itself may be very injurious.

Sprains.—From slipping the heavy draught, or fast-driving horses, are especially liable to sprain of the tendons or ligaments, causing lameness. The parts are feverish, hot, tender, and painful. In all cases of lameness in horses, the foot should be carefully examined, as nails, defective shoeing, or injury of the foot are the most common causes of lameness. In cattle or sheep the feet may also be the most frequent seat of injury. If the heel cannot be put down level on the ground, the strain is located in the back tendons, and if not of recent injury a high-heeled shoe will relieve the strain upon the tender tendon. In acute cases hot applications should be used.

Cuts are dangerous in proportion to the extent, and the vital parts injured. Cleanse with warm water and bandage. If the bleeding is severe, pressure by a firmly folded piece of cotton cloth should be applied and tightly bound up. If the blood flows out evenly, it is from a vein, and the pressure should be greatest toward the extremity, for the venous blood flows toward the heart. But if the blood flows with a throb or beat, it comes from an artery, and is more dangerous, and the pressure must be stronger, from a harder substance, and made firmest nearer the body. As a rule, if you do not know the extent of the injury or the severity of the attack of the disease, send for a skilled veterinary surgeon.

Mange.—This disease may attack many of our domestic animals. It is contagious and is caused by a minute insect burrowing under the skin. Live stock closely confined in winter quarters are more liable to spread the disease. Animals thus affected should be separated and treated persistently till cured. The affected parts should be thoroughly cleansed with soap and water, dried, and have well rubbed in an ointment made of lard half a pound, flowers of sulphur four ounces, and crude carbolic acid two drachms. This applied daily, after perfect cleansing, on the hairy parts of animals. Washing is not a momentary work, but requires the free use of "elbow-grease." The insect must be reached to be destroyed, and nothing but a thorough scrubbing can expose the little tormentor to the destructive application of the remedy. An effective and more convenient remedy, especially for use on smaller animals, is "Little's Patent Fluid," which serves equally well as a sheep-dip and cattle-wash.

Burns and Scalds.—These accidents are liable to all our domestic animals. Small animals, as dogs, cats, and fowls are most frequently subjected to scalds from a careless or thoughtless habit of throwing hot water out of the door or window without looking out for such animals as frequent the house, yard, or doorway for food or kind recognition. Burns are usually the result of fires, or the escape of steam in large establishments. These accidents are dangerous to the life of the animal in proportion to the extent, depth, and vitality of the part burned or scalded. But in all valuable domestic animals, especially horses, the scars or blemishes left from such accidents are of considerable detriment in the value of the animal. Until the veterinarian arrives, exclude the air from the scald or burn, by a saturated (as strong, soluble in water, as it will make) solution of baking soda—bicarbonate of soda—in which cotton cloths are wet, and bound on the parts. The "*Corrow oil*" (equal parts of lime water and linseed oil) is a valuable application as the air is excluded. For the relief of the intense and excruciating pain of burns and scalds, the internal use of laudanum is the most humane and efficient remedy.

What Ails the Pigs.—W. H. Brummer, Yankton Co., S. Dakota, desires to know what ails his pigs. They cough and wheeze. They eat well, and are fed on a variety of good food, but they do not grow or thrive, and their noses become crooked. From the few symptoms given, we presume that the affection of the pigs is inflammation of the lungs, yet the ailment may prove to be hog-cholera, if there are any cases of this disease in the region. A creek may carry the contagion a considerable distance in its course, where there have been pens, or dead hogs, to pollute it. Subscribers who desire our advice for any ailment of animals should write down the appearance of the eye, tongue, the apparent temperature, digestion, condition of bowels, condition of coat, and every prominent symptom. State the position the animal assumes when left to itself. These, with such other information as may occur to the owner, will give us data from which to diagnose the probable disease.

Bites and Stings.—Commonly, bites may be treated as lacerated wounds. But poison-bites should be promptly treated to destroy the poison. Hot water, the hot iron, nitric acid, nitrate of silver, though heroic remedies, in such emergencies may be applied even by the uninitiated. The sooner the applications are made after the accident the better. Where poison-bites are suspected on the extremities, the venous blood flowing to the heart may be retarded by a cord, band, or handkerchief tightly tied around above the wound. A cloth dipped in boiling water applied to the bite destroys the poison, and is not so painful as the hot iron. If the latter is used it should be heated to a white heat and pushed deep into the wound, and swept over the lacerated surface. A stick of nitrate of silver should be similarly applied. The nitric acid should be applied on a fine stick or skewer. After either of these applications, hot or cold applications, by means of wet cloths, should be made. Stings of bees, wasps, or other insects, are best remedied by applying aqua ammonia by means of cloth soaked in a solution of two ounces of ammonia to a quart of water. Carbolic acid, one ounce to a quart of water, is a good application to either burns or bites. It is rarely necessary to use opiates for stings, as the local applications soon relieve pain.

Warbles.—These are so injurious to the hides of cattle as to lessen their value to the tanner from one to three cents per pound. They are the production of the gad-fly, which deposits its eggs on the backs of cattle from May on through the summer. These are hatched into larva, a very small grub, which then bores a hole into the hide, closely concealing itself. As it grows it increases the size of this hole, and in the following spring creeps out from under the skin in the pupa state, and soon changes from that into a gad-fly, and then begins to lay eggs, which produce more larva, and thus it goes on from year to year to the great injury of the hides of cattle. These larva should be carefully looked after and destroyed. They form a small swelling of the skin which is easily detected by passing the hand over the back. It should then be squeezed out, or removed with the sharp point of the narrow blade of the pen-knife. The removal of this grub not only relieves the hide but also the cattle from the irritation it causes. This sometimes become a dangerous inflammation, and then suppurating badly,—disgusting matter, oozing out of the hole made by the larva. Cattle ought to be looked over carefully at least once a week for these grubs, and when found let there be no delay in thoroughly removing them from their hiding place. Several remedies are given to prevent the deposit of the eggs of the gad-fly on the backs of cattle, but they cannot be depended upon entirely, so let the farmer attend well to their detection and removal.

SUNDRY HUMBUGS.

The "Crayon Portrait" Business.

D. B. Seidel, Schuylkill Co., Pa., and John Keever, Cass Co., Indiana, forward to us circulars which they have received from "Portrait Societies." The latter adds "I have been reading the AMERICAN AGRICULTURIST too long to be taken in by these things," but suggest that they be again shown up for the benefit of recent subscribers. One of the circulars purports to issue from Brooklyn and the other from Chicago, but there is a visible family resemblance between them. Both are printed in close imitation of type-writing, and each one offers to make a crayon portrait, free of charge, upon receipt of a photo. The only consideration required is that the receiver shall exhibit it to friends and "promise to get it suitably framed." The little joker does not appear in this circular, but he lies hidden under the phrase quoted above. You do not drop a nickel in the slot to bring him out, but drop a letter inclosing a photograph into the mail. Then comes another circular and a price-list of frames. The circular assures you that the least you can do in return for the crayon portrait is to buy the frame of the "Portrait Society," and you are required to order one from the inclosed price-list. If you comply, the framed portrait and the original photo come to you in due time. The picture is a sun-print touched up with crayon in the strongest parts. Viewed from a little distance it is fair to middling at first, but in time the photographic part fades out, leaving only a few blotches of crayon. The frame,—well, for any one who likes that kind of a frame at the price, it is such a one as he likes. The price, however, is necessarily a liberal one, for if a "Portrait Society" gives away pictures which cost it from a dollar and a half to two dollars each, it must make something more than a retail profit on the frames. In this, as in other matters, those who think they are going to get something for nothing pay very dearly for what they get.

A Swindling "Land Company."

The immense undeveloped resources of many parts of the country offer almost unlimited fields for legitimate enterprise. There are scoundrels who take advantage of this to launch their swindling schemes on the public, or privately bleed the pockets of such as come within reach of their persuasive powers. The victims of this class of swindlers are more likely to be found among business men than those engaged in rural pursuits. A scheme of this sort has been worked in New York city by a man who was one of the proprietors of a Kansas City newspaper. The operator came to New York, made the acquaintance of a young man who was employed as a clerk in the office of a weekly paper, to whom he offered the position of secretary of the "American Land and Colonization Company," on condition that he should take $1,000 worth of stock. The young fellow raised the money out of his father, who was a clerk in a department at Washington. The company was duly organized under the facile laws of New Jersey, an office secured, and the young secretary installed at a salary of $25 a week, paid out of his own money, which was all that ever was paid in. After a few weeks, however, he was dismissed, the scheme vanished, and the promoter disappeared, with the balance in the treasury. He afterward returned to the city and was arrested, but the victimized young man has no prospect of ever receiving the $1,000 again.

Kind Words.

Saved Him Fifty Dollars.—The October number of the AMERICAN AGRICULTURIST has saved me fifty dollars. G. W. GOODRICH, Rockingham Co., N. H.

Worth Double the Money.—Your magazine is worth double the money you ask for it to any one, and to the farmer it is invaluable.
A. A. MANSER, Hampshire Co., Mass.

Ought to be in Every Home.—I think the AMERICAN AGRICULTURIST is the best agricultural paper I have ever read. It is so cheap it ought to be in every home.
J. H. ESTES, Essex Co., N. Y.

Bright and Cheerful.—Your AMERICAN AGRICULTURIST comes every month to lighten up our home in the mountains of Wyoming. It is like our best neighbor—bright, and cheerful, and full of news.
J. F. CROSS, Carbon Co., Wyoming.

1744 MORE FINE PARLOR SETS!

BELOW MANUFACTURER'S COST!

5-PIECE PARLOR SUITS $29.70, WORTH $55.00.

The above is only a poor illustration of the handsome Solid Walnut Frame Parlor Set, with exquisite veneered Panels, Spring Seats, and trimmed in the richest embossed Plush or Black Hair Cloth. In fact, a Parlor Set sold the world over for from $50 to $55, but our price is $29.70 for the entire set of five pieces as above—**SOFA, PATENT ROCKER, ARM CHAIR,** and 2 **REGULAR PARLOR CHAIRS,** finished in any of the following colors or superb embossed Plush, i. e., Crimson, Olive, Gold or Blue, or if desired, each piece trimmed in a different color, all new goods and of the latest patterns, and finely finished throughout. This is a chance in a life-time So, if you want to take advantage of it, send in your orders quick, so as not to get left.

☞ OVER 900 SUITS SOLD IN THE LAST 30 DAYS. ☜

-:- THE WAY IT IS DONE AND WHY WE DO IT!!! -:-

One of the largest Furniture Factories in this city was compelled to sell. They had to have the money; so we bought at our own price; their loss was our gain. We could sell the entire lot without turning our hand over to any dealer in the U. S., but we prefer to sell them at the remarkably low price of $29.70 a set, direct to the consumer, and thereby at the same time it will be an advertisement for our **CELEBRATED AND WORLD-RENOWNED**

$55.95 "MURRAY" BUGGIES and $5.95 MURRAY HARNESS,

which stand ahead of all others as Models of **SUPREME DURABILITY, STYLE, FINE FINISH AND LOW PRICES,** and have branded us in glowing letters that even our competitors can not fail to see as the

LOWEST PRICED HOUSE IN THE COUNTRY.

NOTICE.—As there are some who probably would not want the entire set, we give the following prices on separate pieces:

SOFA, $9.75.—PATENT ROCKER, $7.50.—ARM CHAIR, $6.50.—REGULAR PARLOR CHAIRS, $3.50 EACH.

HOW TO ORDER. We pack each piece nicely ready for shipment, and deliver them free of charge on board cars in Cincinnati. Purchaser pays the freight which on furniture is very light, or if preferred, we will for $2.75 extra, prepay the freigh to any place in the U. S., east of the Mississippi River. Our terms are cash with order, or if purchasers prefer, they can send ½ cash with o der, and balance when goods arrive at destination. Money can be sent by Registered Letter, Post-office Money Order, Express or by draft on Chicago or New York.

As to our responsibility we respectfully refer to the publishers of this paper, and to the Fourth National Bank of this city. Address all orders to

WILBER H. MURRAY MANUFACTURING COMPANY,

MURRAY BUILDING, 139 WEST FRONT ST., CINCINNATI, OHIO, Manufacturers of the Celebrated "MURRAY" BUGGIES and HARNESS.

DARNELL'S PATENT FURROWER & MARKER

Cannot be choked
Runs Steadily.
Adjustable Runners and Marker.
Send for CIRCULAR
Gauge adjustable to all inequalities of ground
Opens a better row in either soft or hard ground than any other Marker.

Leaves the earth well pulverized at bottom of furrow. Marks any width from 2½ to 5 feet, and from a mere mark to 6 inches deep.

"Take pleasure in recommending it. It does the business; is well made and will last for years." *J. S. Collins, Moorestown, N. J.*

"It far exceeds my expectations. If the real merits of this cheap implement were known to potato growers alone, the sales would be immense." *H. L. Coy, Pres. Wash. Co. (N. Y.) Agr. Society*

H. W. DOUGHTEN Manufact'r, Moorestown, Burlington Co., N. J.

Side, Bottom & Tube detachable

AGENTS, READ!

Secure the agency for our Patent labor-saving Household Utensils, and you have a permanent money making business. Our **Centennial Cake and Baking Pan, Combined Flour Bin and Sifter,** and **Pie Plate, Jelly Cake** and **Mountain Cake Pans** with attachment for cutting Pies and Cakes from Pans without breaking, sell at sight to housekeepers. Send $1.25 for full sample outfit of 5 articles, or write for catalogue and terms to **THE CLIPPER MFG. CO. (Limited) Cincinnati, O.**

MAGIC LANTERNS

And **STEREOPTICONS,** all prices. Views illustrating every subject for **PUBLIC EXHIBITIONS,** etc. ☞ *A profitable business for a man with a small capital.* Also, Lanterns for Home Amusement. 152 page Catalogue *free.* **McALLISTER,** Mfg. Optician, **49 Nassau St., N. Y.**

Peach Trees by the million. Also other Fruit Trees. The **WM. H. MOON CO.,** Morrisville, Pa.

DEERING JUNIOR STEEL BINDER.

KING OF THE HARVEST FIELD.

Works Perfectly on Rough, Uneven Ground.—Some Others do not.
Works Perfectly in Tall, Heavy Grain.—Some Others do not.
Works Perfectly in Light, Short Grain.—Some Others do not.
Works Perfectly in Badly Lodged Grain.—Some Others do not.

Strongest Frame, Simplest Construction, Lightest Draft, Greatest Durability, Most Easily Managed. **GREAT IMPROVEMENTS for 1890** place it farther than ever in the lead of pretended rivals.

OUR ASSORTMENT OF GRAIN AND GRASS-CUTTING MACHINERY is made complete with our

DEERING LIGHT REAPER.
DEERING GIANT MOWER. } **Each the Leader in its Class.**
DEERING LIGHT MOWER.

Our **DEERING BINDER TWINE** made by ourselves is the best in the world. We are the only Harvester Manufacturers who adopted this practical method of protecting farmers against poor Twine.

Apply to our nearest agent for **Illustrated Catalogue and Full Information** or write direct to us. **WM. DEERING & CO., Chicago.**

U of M

Agriculture in the Common Schools.

Prominent educators among us have for a long time recognized a serious defect in the course of study in the common schools of the country, in that the study of the natural sciences is almost entirely and in many cases quite ignored. Public attention has been from time to time called to the matter, and the defects of our system, or rather lack of system, dwelt upon, but without enlisting public attention. Particularly has it been claimed that in a farming community, where the scholars are constantly surrounded by works of nature in their myriad forms, the elements of the sciences relating to agriculture should claim a share of attention in the common schools. But public teachers obey the demands of those whom they serve, and do not shape public opinion. Any radical change must come from the parents of the children in the schools, so the scholars must go on grinding over their arithmetic, algebra, and geography or take to the Greek or Latin, as so many of them do, and the natural sciences remain unknown. It is altogether probable that more students would find their tastes leading them to the colleges of agriculture were their attention directed in these channels in their earlier years.

To make this desirable change, the people, more than the educators, must demand it. And to even make a start, text-books must be available for use by the schools. The Somerset Pomona Grange, under the lead of two prominent farmer-educators, Prof. I. O. Winslow and Mr. M. L. Merrill, both of St. Albans, have taken hold of this problem in earnest and with a full comprehension of what is needed in the matter. The matter has been under consideration at several of their meetings in the county, and resulted in their bringing it before the State Grange at Belfast for broader effect and further action. Prof. Winslow is the superintendent of schools in the town of St. Albans, but he realizes that however much of interest may be awakened, he, or any one else, cannot put the elementary study of agriculture into the schools without books for teaching it. So, while cultivating public sentiment, text-books must be provided. The matter was referred to the committee on agriculture, who subsequently made the excellent report published in the *Farmer* of last week, and further moved the raising of a committee of three to pursue the matter and take measures to procure, if possible, the publication of suitable text-books, that one branch of study at least pursued at school shall have direct reference to the occupation of farming. The matter met the cordial response of the State Grange, and Prof. I. O. Winslow, of St. Albans, Z. A. Gilbert, North Greene, and E. H. Gregory, Bangor, were appointed, and took measures to carry on the work.

This movement is an important one, and the parties backing it up no doubt mean business. While starting here in this State it should take a wider range and receive the attention and the coöperation of other State Granges as well. It is a matter too long overlooked, and now that it has been taken in hand by those directly concerned, it should be pushed with energy wherever there are children on the farm to educate. Shall we have agriculture in the common schools? Who seconds the motion?—*Maine Farmer.*

Value of Agricultural Papers.

I have always been a strong advocate of the necessity of farmers taking one or more agricultural journals, and thus keeping posted on matters in which they were most interested. This matter was very forcibly brought into notice last fall. A buyer went through one township in this county and bought most of the winter apples for $1 and $1.10 per barrel, when the market price was $1.50. But the majority of these farmers think they have no money to spend on agricultural papers, nor time to read them, so they lose through this penny-wise and pound-foolish plan forty to fifty cents per barrel on their apple crop, which in many cases is sufficient to pay for more than one agricultural journal during the remainder of their lifetime. To those who paid any attention to business and kept posted as they should do, it was well known that apples would be higher than in some past seasons, owing to the small crop.

Let every man who aims at being a progressive agriculturist, subscribe for the AMERICAN AGRICULTURIST, and also read the agricultural matters in his provincial or county papers, and there will be less grumbling about everybody taking advantage of the farmer. Observe the following: Read, study, think, plan.

REV. JOHN MORRISON,
Lambton Co., Ontario, Canada.

Our Motto

"A dollar's worth for a dollar," is the motto of Hood's Sarsaparilla. This medicine is a highly concentrated extract of Sarsaparilla and other well known vegetable remedies, and is pronounced by experts the strongest and best preparation of the kind yet produced. It owes its peculiar strength and medicinal merit to the fact that it is prepared by a Combination, Proportion and Process peculiar to itself, discovered by the proprietors of Hood's Sarsaparilla and known to no other medicine. Its prompt action on the blood removes all impurities, and cures scrofula, salt rheum, sores, boils, pimples, all humors, and all diseases or affections arising from impure blood or low state of the system.

Hood's Sarsaparilla

Sold by all druggists. $1; six for $5. Prepared only by C. I. HOOD & CO., Apothecaries, Lowell, Mass.

100 Doses One Dollar

THE WM. H. MOON CO.

MORRISVILLE, BUCKS CO., PA.,
NURSERYMEN, HORTICULTURISTS and LANDSCAPE ARCHITECTS,
Offer an immense stock of all kinds of CHOICE
FRUIT AND ORNAMENTAL TREES.

Landscape Gardening in all its details receives prompt and careful attention. **A Valuable Descriptive Illustrated Catalogue Free.**

Dogs, British:

Their Varieties, History, and Characteristics. By HUGH DALZIEL, assisted by Eminent Fanciers.

New Edition, Revised and Enlarged.

Illustrated with **First-Class Colored Plates** and Full-Page Engravings of Dogs of the Day. This will be the fullest and most recent work on the various breeds of dogs kept in England, and as its author is one of the first living authorities on the subject, its accuracy can be relied upon. Demy 8vo. In two volumes.

Price, post-paid, $8.50.

Orange Judd Co., 751 Broadway, New York.

ALL ABOUT FLOWERS

In the HOME or in the GARDEN.

EDITED BY Eben E. Rexford. ILLUSTRATED BY W. Hamilton Gibson.

The best, most practical, and beautifully illustrated floral department in any Magazine. Everything is told about Flowers—how to grow them best; how to keep plants healthy; and how to have the most beautiful flowers. It appeals to every woman who loves flowers, or has a window garden. Every question on flowers cheerfully answered by the editor personally.

FEBRUARY NUMBER OF

THE LADIES' HOME JOURNAL

JUST OUT.

Contains the brightest novels, stories, articles, poems, by such favorite writers as

Rev. T. DE WITT TALMAGE, D. D.
Mrs. ADELINE D. T. WHITNEY,
JOSIAH ALLEN'S WIFE,
MARY J. HOLMES,
KATE TANNATT WOODS,
MAUD HOWE,

and a wealth of attractive reading for the home.

"Mrs. Harrison's Life in the White House"

by A. J. HALFORD, authorized by Mrs. Harrison, with a new portrait and several special views of the White House, will appear in the March issue.

Five Numbers FOR 25 Cents.

Send 25 cents for a Three Months' Trial Subscription—beginning Jan. 1st, and we will send you the double **Holiday numbers**—*November and December*—**FREE!** thus giving five months for only 25 cents; *five of the most beautiful numbers ever published.*

CURTIS PUBLISHING CO., Philadelphia, Pa.

Matters of Business.

(*Continued from Page* 98.)

paper mentions the testimonials bestowed on Dr. Haas' Hog and Poultry Remedy by the Queen's Steward and Purveyor to H. R. H., the Prince of Wales, after having given it a thorough test on their farms. We are pleased to note the added praise this preparation is winning in foreign parts —bespeaking much for the merit of this article, and in view of the fact that English veterinarians have failed to formulate a successful swine remedy. Our readers who have hogs should give this preparation a trial—not that we think the English royal approval will influence them—but thousands of our own swine-raisers testify to its worth.

The Planet Jr.—Farmers and gardeners who have used the favorite and almost universal Planet Jr. will be surprised to see the striking improvements just brought out the present year. One of them is a lever expander, which works promptly, without slipping or uncertainty. Another new feature is a handle brace and bracket by means of which the handles can be set to one side or the other. Nearly a dozen other patented features add greatly to the convenience, strength, and adaptability of the Planet Jr. Dealers and others interested should send for a circular to S. L. Allen & Co., No. 1,107 Market St., Philadelphia.

Keystone Disc Harrow.—The idea of a harrow made to operate with discs instead of teeth was a bold and very successful one. But the old forms of disc harrows had practical defects which are overcome in the Keystone. Among the notable features of the improved implements are the two levers, by means of which either gang may be changed without interfering with the other. The Keystone also has ball bearings in the hangers, which greatly lighten friction and draft. It is a most useful implement for preparing ground for seeding, mixing manure with the top soil, and with the proper attachment, doing the work of both harrow and seed-drill. Send to Keystone Manufacturing Co., Sterling, Ill., for free pamphlet.

S. D. Greenleaf does not believe the Lewiston *Journal's* idea that Aroostook county can grow larger potato crops than any other part of New England. "I have confidence in the soil on the Sandy river in the town of Starks, Me., where I reside, enough so that I think I can raise as many potatoes on an acre as any man can in Aroostook county, and should have done so this year if it had not been for the rust that struck my crop the first of August, consequently I lost two months' growth." The fact is, seasons being equally favorable, maximum potato crops depend in the main upon the man—upon the preparation of the soil, variety, method of planting and culture. Give us a good average season for potatoes in 1890, and farmers in many other States will do fully as well as those in Aroostook.

Fruit-Drying in England.—The preservation of fruits and vegetables, by drying, appears to be far less frequent in England than in this country, probably for the reason that their weather is less favorable for spontaneous drying than ours. There had been various drying or evaporating devices, ranging from sizes suited to the uses of a family up to those costing large sums of money, and several men to operate them. The drying in these went on without regard to weather, and the products they turned out, to distinguish them from ordinary "dried fruit," were called "Evaporated." England remains no longer in ignorance of fruit-drying by artificial heat. *The Gardener's Chronicle*, in one of its recent issues, has an illustrated article on "Fruit-Drying," and says: "Among the prominent objects which were to be seen at the Windsor show of the Royal Agricultural Society, last June, was the fruit-drying apparatus of Messrs. Ph. Mayfarth & Co., of Frankfort-on-the-Main, Germany," and also gives a London address. It gives an engraving of the dryer, describes its operations, and highly commends its products. At the first glance, this illustration had a strangely-familiar appearance. Upon the side of the dryer it is stated in large letters, while on the top a large German eagle illustrates the statement, that it is patent No. 37,623. On the side, in smaller letters than the address of Mayfarth & Co., we read: "Dr. Ryder's Patent." Here was the key to the whole mystery. When Dr. Ryder first brought out his dryer we were so much pleased with its ingenuity, shown in its structure and the excellence of the materials it turned out, that we allowed the apparatus to be exhibited at our office—then at 245 Broadway. This was in 1873, and in our issue for March of that year, Page 89, is given an illustrated description of the apparatus. The prominence it gives to it shows that the *Gardener's Chronicle* knows a good thing when it sees it.

Catalogues Acknowledged.

ETHAN W. ALLEN, Portland, Oregon: Illustrated and descriptive catalogue of field, garden, flower, and tree seeds; also bulbs, implements, etc.

F. BARTELDES & CO., Lawrence, Kansas: Illustrated catalogue of vegetable, flower, and field seeds. Several colored plates.

W. ATLEE BURPEE & CO., Philadelphia, Penn.: Farm Annual and catalogue, a very handsome, elegant pamphlet of 160 pages, giving descriptions and illustrations of all the most desirable vegetables, flowers, field crops, with prices of seeds of the same. Burpee's Bush Bean and other valuable novelties are illustrated in handsome colored plates.

CLEVELAND NURSERY CO., Lakewood, Ohio: Wholesale price list of new strawberries, raspberries, and other small fruits.

JAMES J. H. GREGORY, Marblehead, Mass.: Illustrated and descriptive catalogue of vegetable and flower seeds; also, flowering plants and a very choice collection of many novelties catalogued for the first time.

A. W. LIVINGSTON'S SONS, Columbus, Ohio: Illustrated and descriptive catalogue of tomatoes, prominent among which are The World-Famed Seedlings originated by this firm.

T. H. MCALLISTER 49 Nassau St., New York: Descriptive and illustrated price-list of microscopes, magic lanterns, opera glasses and other optical goods.

C. H. PERKINS, Moorestown, N. J.: Catalogue of fruit trees, grapevines, strawberries and other small fruits; peach trees a specialty.

JAMES M. THORBURN & Co., New York: Descriptive and illustrated catalogue for the vegetable and flower garden, for the lawn, farm, and the nursery. This is one of the most tastefully finished catalogues of the kind which has come to our notice. It contains, in addition to the most complete list of varieties, excellent directions for sowing seeds and the care of plants.

JAMES VICK, SEEDSMAN, Rochester, New York: Abridged catalogue of vegetable and flower seeds; a very complete collection.

SAMUEL WILSON, Mechanicsville, Pa.: Price-list and catalogue of vegetable, field, and flower seeds, also flowering plants, small fruits, and thoroughbred poultry.

WALTER A. WOOD, Hoosick Falls, New York: The latest catalogue of this firm is a gem. The cover is a real work of art, and the pages are replete with interesting and instructive matter relative to the famous harvest machinery of this firm, which was awarded the highest prize at the recent Paris World Exposition.

A Great Event

In one's life is the discovery of a remedy for some long-standing malady. The poison of **Scrofula** is in your blood. You inherited it from your ancestors. Will you transmit it to your offspring? In the great majority of cases, both Consumption and Catarrh originate in Scrofula. It is supposed to be the primary source of many other derangements of the body. Begin at once to cleanse your blood with the standard alterative,

Ayer's Sarsaparilla

"For several months I was troubled with scrofulous eruptions over the whole body. My appetite was bad, and my system so prostrated that I was unable to work. After trying several remedies in vain, I resolved to take Ayer's Sarsaparilla, and did so with such good effect that less than one bottle

Restored My Health

and strength. The rapidity of the cure astonished me, as I expected the process to be long and tedious."—Frederico Mariz Fernandes, Villa Nova de Gaya, Portugal.

"For many years I was a sufferer from scrofula, until about three years ago, when I began the use of Ayer's Sarsaparilla, since which the disease has entirely disappeared. A little child of mine, who was troubled with the same complaint, has also been cured by this medicine."—H. Brandt, Avoca, Nebr.

Ayer's Sarsaparilla

PREPARED BY

DR. J. C. AYER & CO., Lowell, Mass.

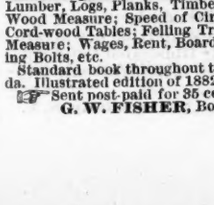
Sold by Druggists. $1, six $5. Worth $5 a bottle.

DR. T. B. MYERS,

of David City, Neb., writes: Dr. Seth Arnold's Cough Killer is the best remedy for whooping cough and measles I ever saw.

SOLD BY ALL DEALERS.

Price, 25c., 50c. and $1 per bottle.



SCRIBNER'S LUMBER —AND— LOG BOOK.

Over One Million sold. Most complete book of its kind ever published. Gives measurement of all kinds of Lumber, Logs, Planks, Timber; hints to lumber dealers; Wood Measure; Speed of Circular Saws; Care of Saws; Cord-wood Tables; Felling Trees; Growth of Trees; Land Measure; Wages, Rent, Board, Interest, Stave and Heading Bolts, etc.

Standard book throughout the United States and Canada. Illustrated edition of 1882. Ask your bookseller for it.

☞ Sent post-paid for 35 cents.

G. W. FISHER, Box 238, Rochester, N. Y.

GOLD MEDAL, PARIS, 1878.

W. BAKER & CO.'S

Breakfast Cocoa

Is absolutely pure and it is soluble.

No Chemicals

are used in its preparation. It has *more than three times the strength* of Cocoa mixed with Starch, Arrowroot or Sugar, and is therefore far more economical, *costing less than one cent a cup.* It is delicious, nourishing, strengthening, EASILY DIGESTED, and admirably adapted for invalids as well as persons in health.

Sold by Grocers everywhere.

W. BAKER & CO., Dorchester, Mass.

BY ONE MAN. Write for descriptive catalogue containing testimonials from hundreds of people who have sawed from 4 to 9 cords daily. 25,000 now successfully used. Agency can be had where there is a vacancy. A NEW INVENTION for filing saws sent free with each machine, by the use of this tool everybody can file their own saws now and do it better than the greatest expert can without it. Adapted to all cross-cut saws. Every one who owns a saw should have one. Ask your dealers or write FOLDING SAWING MACHINE CO., 308 to 311 South Canal Street, Chicago, Ill.

MADE WITH BOILING WATER.

EPPS'S

GRATEFUL—COMFORTING.

COCOA

MADE WITH BOILING MILK.

Save Your Money

BY USING

CLARK'S CUTAWAY HARROW.

10,000 IN USE.

Supersedes the plow; no other tool compares with it; no farmer can afford to be without it; entirely new principles; ground made into a perfect seed-bed. Has a Seeding Attachment for sowing all kinds of grain.

Send for new descriptive circular.

HIGGANUM M'F'G CORP., Higganum, Ct., Sole Manufacturers.

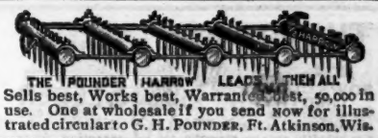
New York Office 189 and 191 Water St., New York.

ESTABLISHED JAN. 1st, 1866.

PATENT WATER PROOFED

CHEAP STRONG **WATER PROOF,** Applied by our new Patent method with ¼ the labor of any other way. Unlike any other roof. No rust or rattle. An Economical and DURABLE SUBSTITUTE for PLASTER on walls. Ornamental CARPETS and RUGS of same material, cheaper and better than Oil Cloths. ☞ Catalogue and Samples Free.

W. H. FAY & CO. CAMDEN, N. J.



Sells best, Works best, Warranted best, 50,000 in use. One at wholesale if you send NOW for illustrated circular to G. H. POUNDER, Ft. Atkinson, Wis.

FARM WAGONS—Best Wagon made $50. Buggies, Carriages, Harness, etc., at ½ price. Send for list. Chicago Scale Co., Chicago.

SALZER'S NORTHERN GROWN SEEDS
SEND FOR IT
VEGETABLE SEEDS
CATALOGUE FREE.
JOHN A. SALZER LA CROSSE WIS.
VEGETABLE SEEDS.
We make a specialty of early, heavy-cropping Vegetables, and offer on trial 35 Packages Earliest Vegetables, postpaid, for $1. 33 Packages FLOWER SEEDS for $1. 15 Pkgs. Choice Flower Seeds, 50c.
- ROSES and BLOOMING PLANTS by the 100,000.
Send for Free Catalogue.
WHITE BONANZA
300 to 500 BUS. PER ACRE
JOHN A. SALZER LACROSSE WIS.

SALZER'S WHITE BONANZA OATS

Unquestionably **THE GRANDEST WHITE OAT IN AMERICA** to-day. It is the **earliest, the most vigorous, heavy-stooling, strong-growing, enormously prolific** White Oats extant. It has positively **taken more first prizes** at Fairs and Expositions, **than any five White Oats put together.** It came off in the great **American Agriculturist Oat contest,** opened to every farmer in North America, with banners flying, taking the **FIRST PRIZE** of

$500 IN GOLD!

Won by R. W. Strickland, Albion, N.Y., yielding **134 bushels and 23 lbs. per acre.** The Editor of the *American Agriculturist*, commenting on this grand Oat, says: "The American Agriculturist pronounces it the most prolific of all other varieties." In order that this magnificent sort may be planted on the farm of every reader of the American Agriculturist, we have **reduced the price to $1.00 per bushel,** and in addition to this we offer a premium of **a new Oat with each lot sent,** if the conditions on the right of this advertisement are followed out. We **have over 5,000 Acres** devoted to the growing of **Farm** and **Vegetable Seeds,** and **test every new variety,** but among all none have the many excellent qualities of White Bonanza. The Seed is cheap, the freights to New York, Pennsylvania, and all other points are low from La Crosse, especially on Seed Grain, while the *extra yield* that you will get will *ten times pay the outlay.*

WE CONTROL THIS NOVELTY EXCLUSIVELY

POTATOES—DAKOTA GROWN—Splendid croppers, excellent flavored varieties, yielding from 200 to 500 bushels per acre.

GRASS and CLOVER SEEDS and FODDER PLANTS in large quantity.

☞ Pamphlet on Grass and Forage Plant Culture **FREE.**

JOHN A. SALZER, LA CROSSE, WIS.

CUT THIS OUT. Send this small slip with your order for White Bonanza Oats and we will add to each one bushel order, one package; each 2½ bushel order, one pint; five bushels, two quarts; 10 bushels, one peck; and for 100 bushel order, 2½ bushels of our **GRAND NEW OAT,** to be offered for the first time in 1891. We predict this new oat will revolutionize oat growing. These Premiums are only sent if this slip is inclosed with order. **JOHN A. SALZER, La Crosse, Wisconsin.**

GENEVA A NEW PEDIGREE WHITE GRAPE.

EARLY, HEALTHY, HARDY, PRODUCTIVE, GOOD.

JOSIAH HOOPES says: "The best of the newer varieties was Geneva, a fine white Grape of excellent flavor."
H. HYATT, Penn Yan, N. Y., says: "There is no mildew or rot on vine or fruit. It is an excellent keeper."
D. GREENAWALT, Franklin Co., Pa., says: "I am much pleased with the Geneva. Quality best."
S. D. WILLARD, Geneva, says: "know of no white grape of recent introduction so rich and pleasing."
For illustrated circular and prices address **R. G. CHASE & CO., Geneva, N. Y.**

NORTHERN GROWN FRUIT and Ornamental TREES

Vines, Shrubbery, BULBS and ROSES

at Wholesale Prices to RETAIL BUYERS. We give more for the money than any other nursery in America. **You cannot afford to do without our Catalogue.** It tells the **whole story** and will be sent **FREE** to all who apply.
J. W. MILLER & CO. Freeport Nursery, FREEPORT, ILL.

EVERGREENS All nursery grown at honest prices. Largest stock in the States of Norway, White and Hemlock Spruce; Scotch, Austrian, White and Mountain Pines; Arbor Vitae, Balsam Fir and Northern Red Cedar: European Larch, White Ash, Maples, Mulberries, Birches, etc. All sizes shipped with safety to all parts of the States. Price list free. **D. HILL,** Evergreen Specialist, **Dundee, Illinois.** Mention this paper.

SEED POTATOES,
RURAL NEW YORKER, NO 2.
Pure seed grown for me in Northern Maine. Write for prices. Inclose stamp. Address
W. B. WHITNEY, Leominster, Mass.

NEW CHRYSANTHEMUM ADA SPAULDING
Choicest Foreign and American Novelties warranted true to name; Selected Hybridized Seed, 25c. per packet. Tuberous Begonias of finest strains. Catalogue on application.
T. H. SPAULDING, Orange, N. J.

CHOICE STRAWBERRY PLANTS
Illustrated and descriptive catalogue free. Send for it.
W. F. ALLEN Jr., ALLEN, MARYLAND.

100,000 APPLE SEEDLINGS, 2 years old, No. 2. Address
STEPHEN HOYT'S SONS, New Canaan, Ct.

TREES Root Grafts—*Everything!* No larger stock in U. S. No better. No cheaper. **Pike Co. Nurseries, Louisiana, Mo.**

THOMPSON'S WHEEL BARROW SEEDER

SOWS CLOVER, TIMOTHY, Hungarian Flax, Millet, Orchard Grass & Red Top. Any quantity per acre correctly. Windy weather has no effect on the distribution. No guess work. *It sows the quantity it is set to sow.* Simple and durable in construction. *Runs light.* Best in the field. Weighs 40 lbs. Send for circular.
O. E. THOMPSON & SONS, Ypsilanti, Mich

LIVINGSTON'S SEEDS

BETTER THAN EVER

Our **1890** Catalogue is a **complete Garden Guide** full of practical ideas about all kinds of **Vegetables, Flowers, Bulbs,** etc., necessary for the garden, is mailed **FREE** to all **who mention this paper.** With **prices lower,** quality higher, better facilities for filling orders promptly, generous treatment and over **40 years** Seed Farm experience enables us to please you.

TOMATOES: BEAUTY, FAVORITE, PERFECTION, -ACME-, PARAGON, POTATO LEAF, GOLDEN QUEEN

A. W. LIVINGSTON'S SONS, Box 170, COLUMBUS, O.

"The Village Nurseries"

We are offering a complete line of Nursery stock, but call especial attention to our prices on the following stock:
Extra fine Pear Trees and Apple Trees.
The Botan or "Abundance" Plum.
The "Wonderful" Peach, June budded.
Asparagus, and Berry Plants.
For prices and descriptive catalogue (free), address
JOS. H. BLACK & SON, Hightstown, N. J.

EVERITT'S CELEBRATED SEEDS 10 Packets SEEDS FREE.
Beautiful Catalogue *5 cents.* Get it before you buy Seeds. J. A. EVERITT & CO., Indianapolis, Ind.

"Yale" Strawberry.

The coming LATE Strawberry for the table, for canning or for market. For further information send for circular.
Address STEPHEN HOYT'S SONS, New Canaan, Ct.

PEACH TREES OF LEADING KINDS from Natural **Tennessee Seed**; general nursery stock. Osage Currants, Grapes, &c.
JOSIAH A. ROBERTS, *Malvern Nurseries,* Malvern, Pa.

SPRAYING FRUIT TREES is an absolute necessity. Our **Perfection Outfit** stirs the liquid automatically, and will spray **160 trees per hour.** Cheapest and Best. Also Outfits for Horse Power. Circulars free.
FIELD FORCE PUMP CO. Lockport, N.Y.

FREE TO ALL.
Send your address immediately, on postal card, for our 80-page elegantly Illustrated Catalogue, describing more than 300 of our Works pertaining to Rural Life.
ORANGE JUDD CO., 751 Broadway, N. Y.

If you want the best Garden you have ever had, you must sow

MAULE'S SEEDS.

There is no question but that Maule's Garden Seeds are unsurpassed. I now have customers at more than 32,500 post-offices. **When once sown, others are not wanted at any price.** My new catalogue for 1890 *is pronounced the most original, beautifully illustrated and readable Seed Catalogue ever published.* **You should not think of purchasing any SEEDS before sending for it.** It is mailed free to customers and to all others enclosing ten cents in stamps.

My Special List of Striking Specialties **MAILED FREE** *to all who write for it, mentioning this paper. Address*

WM. HENRY MAULE.
1711 Filbert St. **PHILADELPHIA, PA.**

TESTED SEEDS

Complete and most carefully selected stock of new and standard varieties of

Vegetable, Flower & Farm Seeds

Garden Tools, Drills and Cultivators.

Illustrated Descriptive **CATALOGUE FREE!** Send for it

W. W. BARNARD & CO.,
6 and 8 North Clark St., CHICAGO, ILL.
(Successors to **Hiram Sibley & Co.'s** Garden Seed and Implement Business at Chicago, Ill.)

The Prize Corn Crop.

The World Beaten

By the unprecedented yield of 254⅞ bushels of Corn on one acre. Seed from above acre for sale at following prices: ¼ pound 25c; one pound 75c; 1½ pounds for $1; ⅛ bushel $5; and with an order for one pound I will send method of preparation, cultivation, etc., and with an order for ⅛ bushel I will send method of preparation, cultivation, etc.; also a picture of my acre of corn, farm, etc. **Special arrangements with seedmen for sale of corn.** Stamps taken for small orders. Address
Z. J. DRAKE, Drake P. O., Marlboro Co., S. C.

10 NUT TREES By mail for **$1.00**
Spanish Chestnuts, American Chestnuts, or English Walnuts. **FREE!** a handsome mail Catalogue.
The WM. H. MOON CO., Morrisville, Pa.

MANAGERS WANTED Everywhere to take charge of our business. Advertise, distribute circulars & employ help. **Wages $50 to $125 per month,** Expenses advanced. State experience. Wages expected, also your preference for home work or traveling. SLOAN & CO., Manufacturers, 294 George Street, Cincinnati, Ohio.

UNITARIAN PUBLICATIONS FREE—Apply to MRS. H. B. CLARKE, Box 55, Rochester, N Y

GRAPE VINES *at greatly reduced rates.* Also **Strawberries Blackberries, Raspberries, Currants, Wonderful Peach,** and other Nursery Stock. *Prices reasonable* Descrip. Catalog with *instructions for planting and pruning FREE.* **JOEL HORNER & SON, Delair, Camden Co., N. J**

Petroleum on the Farm.

H. C. BROWN, MASSACHUSETTS.

Most writers on poultry and agricultural matters advocate the free use of kerosene oil or petroleum upon the roosts, and about other parts of the poultry-houses, for the extermination or prevention of lice. It is an excellent plan to buy a quantity of it at a time so as to have it ready at all times for other useful purposes. It can be obtained in barrels and half-barrels at a very low price per gallon, and may be placed in some unused corner about the buildings. With a faucet in the end and an air-hole above the oil, it will run freely. It will be found very convenient, not only for the poultry-house and the summer chicken-coops, but for other purposes. A little applied to a rusty bolt, or clinging nut, or a rusty screw, will start them, or a drop will take the music out of a creaking hinge. Applied to tools, it prevents rust and helps to remove that already gathered. For paint to be used about farm buildings and fences, it is an improvement to mix a little with the usual linseed oil. It not only cheapens it, but makes it spread more freely and strike in more thoroughly, as it is very penetrating and acts as a preservative to all wooden surfaces to which it is applied. There is nothing better to soften a stiffened piece of leather, and cotton cloth for hot-beds or awnings can be made nearly waterproof by giving it a coating of the oil occasionally. The crude petroleum is better than refined for all these purposes, as it is more penetrating, and consequently more lasting, as well as much cheaper. When a barrel is once laid in, one will wonder how he got along without it, he will find so many ways to make use of it. For one who has to use tar for any purpose like the tarring of roofs, and gets it on the hands, nothing will start it like the petroleum.

Plan the Campaign.—Work well planned is half done. The farmer who knows just what he wants to do when the season for spring's work arrives not only saves time and labor, but is likely to do a much better job than the one does who waits till the last minute before deciding on what he is going to do. While there is leisure, sit down and study the matter over. Decide which field to use for wheat and which one for corn. Think what must be done when spring comes to make all parts of the farm most serviceable. Thinking about it will lead to making changes here and there for the better, if they are decided on now, but which would not be made, very likely, if you gave no thought to them, and they only suggested themselves when the time came when they ought to be done. Then you will be too busy with other work to attend to them, but if planned for, ahead, you will have your work so arranged that it will be carried out properly. Too many farmers wait till spring's work comes with a rush, and then they get it off their hands as easily as possible, and afterward see where mistakes were made. No man can afford to do any kind of business without thinking it out. He must look ahead, and study it, and plan for it. Farming is as much a business as store-keeping, or banking, and as much intelligent study and forethought can be, and ought to be, put into it.

SEEDS! SEEDS! SEEDS!

To our friends who have not already received it, we are ready to mail our

NEW CATALOGUE OF

High-Class Seeds for 1890,

Containing all the novelties of the season, both in Vegetable and Flower Seeds.

J. M. THORBURN & CO.,

15 John Street, New York.

HARWOOD Contains a tract of the RICHEST HAMMOCK land in Florida, producing the BEST ORANGES, WITHOUT FERTILIZERS.

This State **(FLORIDA)** offers great inducements to farmers with SMALL MEANS and LARGE ENERGY.

And the same **LAND** on which a grove is planted will yield VEGETABLES and small FRUITS sufficient to provide a COMFORTABLE LIVING INCOME until the trees mature.

To each purchaser of TEN acres, the **COMPANY** GIVES a residence plot on its HIGH PINE RIDGE. Address, J. H. HUBBELL, Pres't, 317 Broadway, N. Y.

All kinds of Fruit and Ornamental Trees and Plants (new and old and strictly true to name) at almost half price. Lovett's Guide to Horticulture gives their prices, merits and defects, and tells how to purchase, plant, prune, cultivate, etc. It is a handsome book of over sixty pages, finely printed and profusely illustrated. With colored plates, 10c; without plates free.

Trees and Plants to distant points by mail and express a specialty.

A copy of *Orchard & Garden* sent free to all who state where they saw this advt.

J. T. LOVETT CO., Little Silver, N. J

CHRYSANTHEMUMS

We have undoubtedly the most charming novelties in this flower ever introduced. Winners of **the first Prize**, and receiving the highest honors **wherever exhibited.** A revelation to all who have seen them. They are so elegant that we wholesale the single flowers for twenty-five cents each, which will give some idea of their choiceness, when good kinds as usually grown bring one cent each. **These are fully described in our large illustrated Catalogue of all THE BEST NEW SEEDS AND PLANTS.** It is very complete, handsomely illustrated, artistic, of particular interest to all lovers of choice flowers. Sent free to all readers of the AMERICAN AGRICULTURIST inclosing stamps to pay postage. Our importation of **THE GOLDEN BANDED LILY OF JAPAN** has just reached us. We offer fine strong bulbs of this, *"The Queen of Lilies"* (Hardy), 30c each; 4 for $1, post-paid. Address, mentioning the AMERICAN AGRICULTURIST,

F. R. PIERSON, Florist and Seedsman,

P. O. Box A. TARRYTOWN, N. Y.

BURPEE'S SEEDS BEST

ARE THE

it is possible to produce by constant, most critical care, and are **WARRANTED,—few equal and none better.** Handsomely illustrated **CATALOGUE,** with **colored plates painted from nature,** of **RARE NOVELTIES** of sterling merit, mailed **FREE** to any address. *W. ATLEE BURPEE & CO., Philadelphia, Pa.*

ROSY MORN POPPY A superb novelty with flowers of a most unique and enchanting shade of **Amber Rose. An entirely novel color in Poppies.** The flowers are extremely double, and the plant is altogether one of the most beautiful and distinct ever introduced. We consider this introduction so valuable that we propose to make it known everywhere; and to do this we make the following

SPECIAL OFFER For only **10 Cents** in stamps or cash, we will mail **Free** to any address a liberal packet of the Seed, accompanied by our **NEW SEED ANNUAL** for 1890, which is handsomer than ever. It is a finely illustrated book of **98 pages,** with illuminated cover in eight colors, and should be in the hands of every one interested in gardening or farming who want the **Newest and Best** of the world affords in **Vegetable, Flower and Farm Seeds.** This book is free to all who use Seeds; to others, 15c. Send for a copy at once.

JOHN GARDINER & CO. {Growers, Importers and Dealers in Vegetable, Flower and Farm Seeds,} **21 N. 13th St., Philada., Pa.**

FOR 25 CTS.

we will mail postpaid these four packets of novelties in flowers.

OUR ILLUSTRATED CATALOGUE OF

CELEBRATED ROCHESTER SEEDS

Mailed FREE to all Applicants. Address

MOREHOUSE & COBB. 46 Franklin St., Rochester, N. Y.

INCUBATORS!

THE OLD RELIABLE CENTENNIAL.

Fifteen years in successful operation. 5,000 in use giving entire satisfaction. For circulars, address

THE CENTENNIAL CO., Box 10, Rye, N. Y.

SEEDS 6 pkts. of my choicest Flower Seeds 10c. Beautiful catalogue free

F. B. MILLS, Thorn Hill, N. Y.

DOUBLE Breech-Loader **$6.75.** RIFLES $2.00 PISTOLS 75c **GUNS** All kinds cheaper than elsewhere. Before you buy, send stamp for Catalogue. Address **POWELL & CLEMENT, 180 Main Street,**

BALDNESS—DANDRUFF—MEXICAN SOAP-Plant, Nature's infallible remedy. 1 lb. post paid, 50 cts., 3 lbs., $1. Full directions accompanying. Address **F. F. STILES,** Canon Diablo, Arizona.

The ELKHART CARRIAGE & HARNESS MFG. CO.

No. 1 Farm Harness, $23.00.

Deals direct with Consumers at Wholesale Prices

And has Done this for 16 YEARS, Platform Wagon, $50.

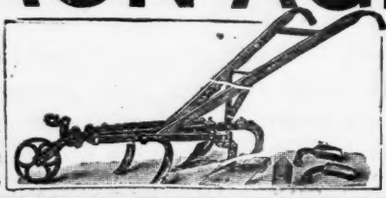
Saving them the dealers profit. We ship anywhere for examination before buying. We pay *freight charges both ways* if not satisfactory. Warranted for two years. Top Buggies, $75; fine as sold at $100. Phaetons, $125; same as sold at $165. Road Carts, $14. Full line of Harness, *all No. 1 Oak Leather*

64-page Illustrated Catalog Free

Address, **W. B. PRATT, Sec'y. Elkhart, Ind.**

THE IRON AGE Implements

The immense popularity of these Tools prove them to be unrivalled. They cannot be excelled. Send for Catalogue showing improvements for 1890.



NEW MODEL *SEED DRILLS.*

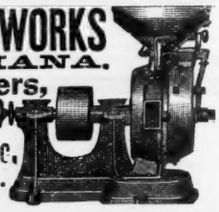
GEM AND JEWEL *WHEEL HOES.*

E. S. & F. BATEMAN,
Spring Mills, N. J.

RICHMOND CITY MILL WORKS

RICHMOND, INDIANA.

Corn and Cob Crushers,
FRENCH BURR MILLS,
PULLEYS, SHAFTING, BELTS, etc.



EVERY MILL GUARANTEED.
SEND FOR DESCRIPTION AND PRICES.

THE SCIENTIFIC GRINDING MILL

THE BEST MILL ON EARTH

GRINDS EAR CORN, SHUCKS ON OR OFF, and all small Grains, in fact everything which can possibly be utilized for Feed. Has SAFETY BOTTOM and other practical devices, to prevent breakage, in case iron should accidentally get into the Mill. Reversible, Self-sharpening GRINDING PLATES fully guaranteed. Sold on trial. All Mills Double capacity of all others. Send for catalogue. Address
THE FOOS MANUFACTURING COMPANY, SPRINGFIELD, OHIO.

CRIMPED

SYKES' IMPROVED Best Roof in the World. Suitable for all classes of buildings. Easy put on.

All my Iron and Steel is rolled and box annealed, well painted on both sides with the Best of Paint and Pure Linseed Oil.

CORRUGATED

SYKES IRON ROOFING CO., NILES, OHIO.
Send for Circular and Price List, and mention this paper

FOR POULTRY! FREIGHT PREPAID. Made from Raw Bone. About the size of Corn. Write for prices. Delivered at your Railway Station.
E. S. FITCH, Bay City, Mich.

GRANULATED BONE AND OYSTER SHELLS

OUT OF PAPER?

Mail Rates, 16 cents per pound, Express often cheaper.

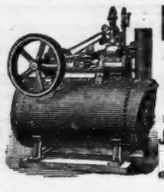
ASK YOUR STATIONER FOR THE { BOSTON LINEN, BOSTON BOND, BUNKER HILL LINEN,

FINE PAPERS AND ENVELOPES.

☞ If he does not keep them, send us three two-cent stamps for samples of these and other writing papers, representing more than 250 Varieties which we sell BY THE POUND, from 15 cents upward.

SAMUEL WARD CO. (Incorporated), Stationers, Engravers and Printers, 49–51 Franklin St., formerly of 184 Devonshire St., Boston.

NO SOIL FARM CHEAP, BLIZZARDS, CYCLONES, long line of expensive freights but in the World —with— BEST PAYING MARKETS The FINEST, RICHEST right at the door for farmers in Michigan. How to get a long time, easy payments, and full information, address O. M. BARNES, LANSING, MICH.



FARM ENGINES

Upright and Horizontal, Stationary, Portable and Semi-Portable.
5 to 16 Horse Power.
Illustrated Pamphlet Free. Address
JAMES LEFFEL & CO.
SPRINGFIELD, OHIO,
or 110 Liberty St., New York.

We will furnish the most economical roofing and siding, all styles. Also Metallic Shingles from Iron or Steel with full directions and low prices.

GARRY IRON ROOFING CO., Cleveland, O.
Mention Agriculturist.

ERTEL'S
VICTOR HAY & STRAW PRESS

Shipped anywhere to operate on trial against all others; purchasers to keep the one doing most and best work for least money. Thousands in use. Established 1867. Circulars free. Address Manufacturers, GEO. ERTEL & CO., Quincy, Ill., U.S.A., or London, Can.

COOK FEED FOR YOUR STOCK

With the TRIUMPH STEAM GENERATOR and save ⅓ to ½ of your feed. Also ENGINES & BOILERS, GRINDING MILLS, CORN SHELLERS, Tank Heaters, &c. Send for Catalogue A and state what you want.
RICE & WHITACRE M'F'G CO.
42 & 44 W. Monroe St., Chicago.

CIDER MACHINERY

Knuckle Joint & Screw Presses, Graters, Elevators, Pumps, etc. Send for Catalogue
Boomer & Boschert Press Co 216 W. Water St. Syracuse, N.Y.

FLORIDA. BUSINESS. $20,000 can be made by the Right party who means business. $10 per day to Agents and Brokers. Address,
NED E. FARRELL,
Santa Fe Improvement Co., Waldo, Florida.

FINE STOCK RANCH—17,000 Acres, subdivided into several pastures. Fenced with stone wall and seven-barbed wire. Cedar and other valuable timber. Mesquit and other grasses. Good winter shelter for stock; abundant and permanent running water well distributed. Two miles from Wetmore, on I. & G. N. R. R., 11 miles north of San Antonio; elevation 1,100 ft. Will sell all or half. JOSEPH P. DEVINE, San Antonio, Texas.

SUN-LAND.

"Life in Southern California."

Send 20 cents for the two:

LOS ANGELES { TIMES Annual No., (48 p.) WEEKLY MIRROR, (12 p.) (Standard publications.)

Or send $2 for the MIRROR 52 weeks (624 large pp). Full and valuable information about the most famous section of the Union. TIMES-MIRROR CO., Los Angeles, Cal.

HOMES FOR ALL in the South along the line of the MOBILE & OHIO RAILROAD. Cheap lands, good health, good water, a mild climate, good markets for your products, and in fact all that conduces to success in Agricultural and Mechanical pursuits. You can purchase ROUND TRIP LAND-SEEKERS' TICKETS, VIA the MOBILE & OHIO RAILROAD, from ST. LOUIS, MO., to almost any point in our territory, at very low rates, GOOD FOR FORTY DAYS from date of sale, with privilege of STOPPING OFF AT PLEASURE south of the OHIO River. For further information in regard to rates address J. N. EBERLE, Land and Immigration Agent, No. 423 Chestnut Street, ST. LOUIS, MO., or G. W. KING, Gen'l Pass. Agt. M. & O. R. R., MOBILE, ALA. Address the ALABAMA LAND AND DEVELOPMENT CO., or HENRY FONDE, Pres., MOBILE, ALA., for circulars or other information in regard to land IN ALABAMA.

THE STEVENS PORTABLE MILLS For CORN and FEED GRINDING

GENUINE FRENCH BUHR STONES

Power Corn Sheller

Prices Below the Lowest

A. W. STEVENS & SON

40 WASHINGTON ST., AUBURN, N.Y.

THE EDWARD HARRISON MILL CO.,

Manufacturers of

Harrison's Standard Burr Stone Grinding and Flouring Mills of all sizes and varieties, possessing great capacity and durability. Mills sent on trial to responsible parties. Low Prices. Write for New Illustrated Catalogue and mention this paper. The Edward Harrison Mill Co., New Haven, Conn.

Walter's Patent Cooper's Patent SHINGLES.

Cooper's Broad Rib Roofing,

Made from Tin and Steel Plate. For public and private buildings, barns and outhouses. Absolutely rain, storm and fire proof, easily applied, artistic in finish, without any exceptions the BEST IN THE WORLD; catalogues free. Address NATIONAL SHEET METAL ROOFING CO., 509 East 20th St., New York City. Mention this paper.

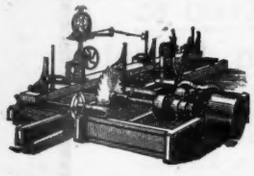
Engines, Wood-Planers, and Veneer Machines.

$160 Farmers' Saw Mill.

Also Hege's Improved Circular Saw Mill with Universal Log Beam, Rectilinear Simultaneous Set-Work and Double Eccentric Friction Feed. Manufactured by the

Salem Iron Works

Salem, N.C.



FARMERS! $ SAVED!

A Perfect Spring Wagon for $5.00. 3 in. high, perfectly graduating. Price per 2-ton set delivered $5.00. Agents Wanted. Write us.

RACINE BOLSTER SPRING CO'NY

RACINE, WIS.

STEAM! STEAM!

Quality Higher, Price Lower.

For Strictly Cash, Complete Fixtures except Stack.

2-Horse Eureka Boiler & Engine, $135

4- " " " " $210

Other sizes at low prices. Before you buy get our prices.

B. W. PAYNE & SONS,

DRAWER 55, ELMIRA, N. Y.

THE PERKINS' Wind Mill

is the Strongest and Best Self-Regulating Wind Mill made. Full instructions for erecting sent with the first mill. All Wind Mills warranted. For Circulars and Prices address

The Perkins' Wind Mill & Ax Co.

Agents wanted. Mishawaka, Ind.

FARMERS We make the only Saw Mill in America that *fully* suits your purpose. Cuts 2000 ft. per day with 4 H. P., and 10,000 with 15 H. P. Larger sizes up to 50,000 ft. per day. Also Portable Corn and Flour Mills, Water Wheels, etc. Send for catalogue. DeLOACH MILL MFG. CO., ATLANTA, GA.

1,000,000 PEOPLE WANT MY CELEBRATED $3 GRINDING MILL.

BEST AND CHEAPEST.

Send at once for Circular and Testimonials.

F. B. MALLORY, Flemington, N. J.

$1.80 FOR THE TWO BEST JOURNALS

IN AMERICA, WITH $50 TO $100 CASH FOR CORRECT SOLUTION OF A PROBLEM.

20 Cents Additional secures a copy of the Farm and Household Cyclopedia.

THE CINCINNATI WEEKLY ENQUIRER

is the Largest Paper in the United States; is the Best Family Journal for Progressive and Enterprising People. The Enquirer will pay

TWO THOUSAND DOLLARS

to Agents sending it the largest number of Subscribers between November 1, 1889, and March 31, 1890, besides the regular liberal commissions.

To assist Agents the *Enquirer* will also give to the subscribers thus obtained, Cash Premiums amounting to FIFTEEN HUNDRED DOLLARS for correct, or as near correct answers as possible, to the following problem, namely:

What will be the total number of subscribers in the first 5 largest lists received in the above contest? It may be near 500, and it may be near 5,000. No one can tell exactly, but may figure on it and guess at it. WE WILL PAY

$100 FOR THE FIRST NEAREST CORRECT GUESS.

$50 for the 2nd Nearest Correct.	$50 for the 14th Nearest Correct.
50 for the 3rd Nearest Correct.	50 for the 15th Nearest Correct.
50 for the 4th Nearest Correct.	100 for the 16th Nearest Correct.
50 for the 5th Nearest Correct.	50 for the 17th Nearest Correct.
100 for the 6th Nearest Correct.	50 for the 18th Nearest Correct.
50 for the 7th Nearest Correct.	50 for the 19th Nearest Correct.
50 for the 8th Nearest Correct.	50 for the 20th Nearest Correct.
50 for the 9th Nearest Correct.	100 for the 21st Nearest Correct.
50 for the 10th Nearest Correct.	50 for the 22nd Nearest Correct.
100 for the 11th Nearest Correct.	50 for the 23rd Nearest Correct.
50 for the 12th Nearest Correct.	50 for the 24th Nearest Correct.
50 for the 13th Nearest Correct.	50 for the 25th Nearest Correct.

Every yearly subscription received from November 1, 1889, to March 31, 1890, is entitled to one guess. The money will be paid out as above, no matter how far from correct the answers may be. It is a business problem with advantages to no subscriber, fair alike to all, early and late comers, as no evidence of what will be the correct answer can be had until the last subscription is recorded. To avoid errors and useless labor, subscribers must write their names and post-office address, with number guessed at, on a separate slip, and inclose it in their letter, which should also contain name, post-office and guess.

THE WEEKLY ENQUIRER Costs $1.15 a Year.

THE AMERICAN AGRICULTURIST Costs $1.50 a Year.

By pooling expenses a combination has been arranged whereby

THESE TWO GREAT JOURNALS CAN BE SOLD TO SUBSCRIBERS FOR **$1.80,**

for which sum both papers will be mailed one year to same person, including one guess on the Cash Premium offered above.

In addition we will forward

FREE TO EVERY SUBSCRIBER

to the above combination sending 15 cents extra for mailing expenses a copy of

THE FARM AND HOUSEHOLD CYCLOPÆDIA.

544 PAGES Bound in Cloth. Embellished with Artistic Designs in black and gold. 249 ILLUSTRATIONS.

As the price of this Book alone is $1, we are offering

THE VALUE OF $3.65 FOR ONLY $2.00.

This book is a *complete ready-reference library* for farmers and housekeepers, being filled with useful facts, hints and suggestions upon all subjects pertaining to **rural** and **domestic affairs**, embracing the results of experiment and research by scientific and practical men and women in all civilized countries. It contains the **cream** or **substance** of more than a **dozen** ordinary **agricultural** and **household books**, and is the only first-class work of the kind ever sold at less than six dollars. It is a book to be **consulted every day** in any emergency, and to be **read** at all times with **interest** and **profit.** It is such a book as **every farmer** and **housekeeper needs** and ought to have, supplying the universal want of a reliable counsellor upon every topic relating to the farm and household. The work is profusely illustrated, and is divided into two general headings, viz., THE FARM and THE HOUSEHOLD, each of which occupies half the book. These are again subdivided into a number of departments, as follows:

Rural Architecture, Fences and Gates, Field Crops, Fertilizers, The Garden, Orchard and Vineyard, Small Fruits, Live Stock, The Poultry Yard, The Dairy, The Apiary, Farm Implements, Around the Farm, Cooking Recipes, Ladies' Fancy Work, Floriculture, The Home Physician, The Toilet, The Laundry, Hints and Helps.

All of the above subjects are fully and ably treated in this valuable book. It is a vast storehouse of useful facts, hints and suggestions of the utmost value to farmers and housekeepers, and no man who has a home and an acre or more of land can afford to be without it.

$2.00 WILL PAY FOR AMERICAN AGRICULTURIST One Year, WEEKLY ENQUIRER One Year, THE FARM AND HOUSEHOLD CYCLOPEDIA,

AND A GUESS FOR CASH PREMIUMS.

This most liberal offer is only made possible by pooling expenses of two great journals, thereby enabling them to compete in price with the less meritorious and worthless cheap publications.

The ENQUIRER is second to no other publication in the country where size, merit, progress and enterprise count, while the AGRICULTURIST stands at the head of its class. Remittances can be made to

THE ENQUIRER CO., - - Cincinnati, O.

—OR TO—

THE AMERICAN AGRICULTURIST, - - - - New York, N. Y.

Dress Silks in 1890.

We have arranged to supply an unusually large demand for Silk Fabrics during the year.

Our Silk Department is thoroughly organized and equipped for the extra work devolving upon it. We have everything that is desirable to suit all the tastes and uses calling for these materials.

Especial attention will be paid this season to Plain and Fancy Silks—striped, brocaded and printed—of lighter weights, suitable for spring and summer wear; in particular, to those that will not pull or crack, will not fade or spoil in washing.

Requests for samples, to receive proper attention, should state clearly the kind of fabrics desired.

James McCreery & Co.,

Broadway and 11th St., New York.

DETROIT SURE GRIP Steel Tackle Block.

HALF THE COST of hoisting saved to Machinists, Builders, Contractors and OTHERS. Admitted to be the greatest improvement EVER made in tackle blocks. Order through dealer. Freight prepaid. Write for catalogue.

Fulton Iron and Engine Works,

Estab. 1842. 30 Brush St., Detroit, Mich.

WARRANTED THE BEST Practical Stump Puller made.

BENNETT'S IMPROVED **STUMP PULLER**

Sent anywhere in the U. S. **On Three Days Trial.** On runners. Worked by 2 men. LIFTS 20 TO 50 TONS. Five sizes. Price, $35 to $70. Circulars free. Man'f'd by

H. L. BENNETT, Westerville, O.

NOW READY.

Mushroom Culture.—Its extension and improvement. With numerous illustrations. By W. ROBINSON 12mo, Cloth, 50c.

Asparagus Culture.—The best methods employed in France and England By JAMES BARNES and WM. ROBINSON. 12mo, Cloth, 50c.

Orange Judd Co.,

751 Broadway, New York.

YANKEE SWIVEL PLOW.

The Leading Wood-Beam Reversible Plow.

SEND FOR CIRCULARS.

Sizes For One, Two, or Three Horses.

NOW OFFERED With Foot Latch, High Standard, Straight Cutter, Automatic Jointer, or Rolling Caster Coulter.

Belcher & Taylor Agricultural Tool Co.,

Box 120. CHICOPEE FALLS, MASS.

DO YOU WANT A FARM?

If so, write for *Free* Catalogue.

Best and newest Map of Virginia, 20 cents.

HENRY L. STAPLES & CO., Richmond, Virginia.

PATENT LAMP-LIGHTER, by mail, 25 cents; chimneys left on. Agents wanted. BOX 23, Germantown, N. Y.

FREE TO ALL.

Send your address immediately, on postal card, for our 80-page elegantly Illustrated Catalogue, describing more than 300 of our Works pertaining to Rural Life.

ORANGE JUDD CO., 751 Broadway, N. Y.

FLORIDA

FREE HOMESTEADS FOR YOURSELF, YOUR WIFE AND YOUR CHILDREN.

LAND IS THE BASIS OF ALL WEALTH.

The Land of Flowers, of Orange Groves, of Perpetual Summer! Healthy, Prosperous, Delightful! Nature's Sanitarium!

The Grandest Colonization Enterprise ever offered to The American People.

THE CO-OPERATIVE LAND AND IMPROVEMENT CO.

Offers You a Beautiful Cottage Site, Business Lot or Orange Grove Tract **FREE** in one of the Best Locations in that favored State, Florida.

WARRANTY DEED, FREE OF INCUMBRANCE. TITLE PERFECT. LAND AND LOCATION UNEXCELLED.

READ OUR PROPOSITION

This Company, incorporated with an authorized capital of $200,000, own and control 10,000 acres of land in and around Leroy, Marion County, Florida. To enhance the value of all this land by large and diversified ownership, the Company propose to give away a portion of this property in

40 ACRE TRACTS, 20 ACRE TRACTS, 10 ACRE TRACTS, 5 ACRE TRACTS, COTTAGE SITES AND BUSINESS LOTS.

All of these tracts are suitable for Orange, Lemon, Grape and Early Vegetable Culture. The above Tracts, Cottage Sites and Business Lots consist of about one-fourth our lands. By giving away one-fourth and reserving the balance we expect the price to quadruple within a year, as many will undoubtedly settle and improve.

This land will be allotted as applications are received, IN A FAIR AND EQUITABLE MANNER, and with no preferences. Each applicant receives a Warranty Deed Option Bond, numbered and recorded, which entitles the holder to one of the Lots or Tracts above specified.

NO CHARGE FOR THE LAND.

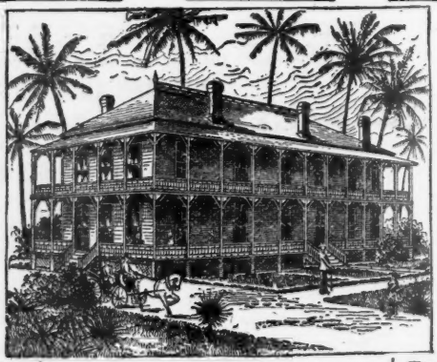
No charge whatever is made for the Land, but we require all to send 25c. Postal Note or Cash, or 30c. in Stamps, when application is sent. This amount is a pro-rata charge to help pay for this advertisement, postage, and also a handsomely illustrated book on Florida, its climate, soil, orange culture, etc., and is in no sense a charge for the deed bond or the land it calls for. You are not obligated to have the deed executed if the location or land does not suit you, and the 25 cts. expense will be returned in such case.

LEROY, MARION COUNTY, FLORIDA,

Has been rightly named by the press as

FLORIDA'S PHENOMENAL CITY.

All our lands are located in and around LEROY, MARION CO., FLORIDA, ten miles from Ocala, the county seat, a thriving city of 4,500 inhabitants. It is all high, dry, rolling pine land, free from swamps or malaria, and one of the healthiest locations in Florida. THE SILVER SPRINGS, OCALA AND GULF RAILROAD runs through it. Splendid



HOTEL MATANZA, LEROY, FLA.

Hotel, Depot, Stores, Saw Mill, Sash and Blind Factory and Cottages already built.

Over 10,000 people now own property there and hundreds of new settlers coming in every year.

It is estimated that 200 houses will be built there during the winter, besides a large Sanitarium, Church and School-house, and the Farmers' Alliance Stores, which will make LEROY a great centre for shipping all kinds of fruits and farm products. House lots are now selling as high as $100 and five-acre orange grove tracts, $250.

Rural Free Press, Ocala, Fla., says:

"The land is high, rolling pine, and considered equal to any pine lands in the State. Any of the semi-tropical fruits, such as oranges, lemons, limes, bananas, pineapples and guavas do as well on pine lands as hummock."

The Ocala Banner says:

"The lands are high, dry and rolling, and LEROY is one of the finest and healthiest locations in the State, and all that the Company claim for it is strictly within the bounds of facts."

Mr. A. P. Mann, Jr., General Manager of the Silver Springs, Ocala and Gulf Rail Road, in speaking of this land, says:

"It is all high, dry, rolling and fertile pine land, and there is no more healthy location in Florida. The surrounding country, as well as this land, is especially adapted to ORANGE and VEGETABLE culture, as well to upland rice, long staple cotton, corn, and choice varieties of tobacco."

CLIMATE AND HEALTH.

The climate of this section is unsurpassed by any in the world, not even excepting Italy. Cool, balmy, delightful breezes are constantly blowing between the Gulf and the Atlantic. This immediate neighborhood is well adapted for a Summer as well as a Winter resort.

MONEY LOANED. This Company is prepared to loan money for improvements upon property secured from the Company, giving five years to pay for same. Plans of houses will be furnished free upon application to those wishing to build.

LOCAL CLUBS. To those wishing to form clubs in their town we will send five warranty deed option bonds for $1.00; ten for $2.00; fifteen for $3.00; twenty-five for $5.00; forty for $8.00; fifty for $10.00. No more than fifty will be sent to any one club.

WRITE TO-DAY. Before free property is all taken, send in a club, and have your friends interested with you. If free property is all taken when your order is received, money will be returned. Send money by Postal Note, Money Order, or Registered Letter.

Address CO-OPERATIVE LAND AND IMPROVEMENT COMPANY, 45 Broadway, New York City, N. Y.

ENDORSEMENT. Ocala, Fla., Dec. 10, 1887.—We, the undersigned, hereby certify that the land in and around Leroy, Marion County, Florida, is high, dry, rolling pine land, well located on the S. S., O. & G. R. R., of fair quality, and will compare favorably with the average pine lands of Florida, and bids fair to enhance in value. J. R. MOREHEAD, County Surveyor; H. W. LONG, County Commissioner; F. E. HARRIS, Editor Ocala Banner; T. W. HARRIS, Editor Free Press; A. P. MANN, Jr., Gen'l Manager S. S., O. & G. R. R.; JAMES L. WHITE, Ex-County Surveyor, and others. ☞CUT THIS OUT.☜

THE AMERICAN AGRICULTURIST BOOK BULLETIN

OF NEW BOOKS, IMPORTATIONS AND STANDARD WORKS ON

Agriculture, Horticulture, Live Stock, Architecture and Rural Affairs.

Published by the ORANCE JUDD CO., 751 Broadway, New York.

An Event in Agricultural Literature.

HOW CROPS GROW: A Treatise on the Chemical Composition, Structure and Life of the Plant, with Numerous Illustrations and Tables of Analyses. By SAMUEL W. JOHNSON, M. A., Professor of Theoretical and Agricultural Chemistry in the Sheffield Scientific School of Yale University; Director of the Connecticut Agricultural Experiment Station; Member of the National Academy of Sciences. 12 mo.; pp. 400; $2. New York: Orange Judd Company, 751 Broadway.

A number of years since, an American chemist called upon the famous Liebig in Munich, and in telling a friend about it afterward, complained that "all Liebig would talk about was Johnson and his book." The book was, "How Crops Grow," which had lately appeared, and which Liebig had caused to be translated into German by his son, and printed for the use of German readers.

The first edition of this work was published somewhat more than twenty years ago. Its subject, scope, accuracy, and clearness, and its fitness for the wants of the time, were such as not only to command the warm appreciation of American students, but to lead to its translation and republication in eleven different European and Asiatic languages. No surer evidence than this could be given of the service it has rendered to the farmer and student, or the credit it has done to American scholarship.

With the advance of knowledge, a new edition has become pressingly necessary. This is now before us. To bring the facts of a rapidly-growing branch of science up to date has, of course, required much careful labor of its author. In arrangement, this edition is similar to the first, the changes of arrangements being, in the main, such as are called for by the results of later research.

The work is in three divisions. Division I treats of the chemical composition of plants. Enough of explanation of chemical terms and principles is given to aid the non-scientific reader. The different elements and compounds of which plants are composed are treated in sufficient detail to make the work satisfactory for either the class-room or for general reference. In the earlier pages, we learn what are the constituents of the volatile parts of plants, and how great is the variety of compounds which unite to make up their tissues and fluids. The student of agricultural chemistry will be helped by the enumeration and classification of the principal organic compounds of plants, and the layman will be surprised to learn how numerous and complex they are. The ash and its ingredients are treated in like detail. Then follow accounts of experiments, by water culture and other methods, which have given us a considerable part of our definite knowledge as to the functions of the ash ingredients of plants. The composition of the plant in its several stages of growth is discussed, and thus the treatment of this part of the subject is rounded out.

Division II treats of the structure of the plant and the offices of its organs. The vegetable cell is described, the transformations in its contents are referred to, and the vegetable tissues touched upon. The vegetative organs, including the root, stem, bud, leaf, and reproductive organs, are discussed, the fruit and the seeds being treated in considerable detail.

Division III is devoted to the life of the plant, including germination and its phenomena, the food of the plant after germination is done, its juices and their movements, and kindred topics. The temperatures at which seeds sprout, the times required for their germination, and the chemical changes involved, are explained. Grape-growers will be interested in what is said of "bleeding," and maple-sugar makers in the discussion of the "flow of sap," while the student of physics will observe the beautiful ways in which the principles of his science apply in the processes by which the ingredients are transferred from place to place within the plant.

An especially useful feature of this work, and one which makes it indispensable to many students, editors, writers, and intelligent farmers in this country, is found in the fact that it summarizes in brief, clear form the results of an immense amount of research which has been carried on in foreign countries, and recorded in foreign languages. The original descriptions are inaccessible to most American and English readers, and, on account of their number and detail, would be of little use if they had them. The wants of such readers—and their name is legion—can be met only by special treatises such as the one before us.

The scope of the work is partly set forth in the introduction, where the author says, with force and truthfulness:

> The farmer deals with the plant, with the soil, with manures. These stand in close relation to each other, and to the atmosphere which constantly surrounds and acts upon them. How the plant grows,—the conditions under which it flourishes or suffers detriment,—the materials of which it is made,—the mode of its construction and organization,—how it feeds upon the soil and air,—how it serves as food to animals,—how the air, soil, plant, and animal stand related to each other in a perpetual round of the most beautiful and wonderful transformations,—these are some of the grand questions that come before us; and they are not less interesting to the philosopher or man of culture than important to the farmer who depends upon their practical solution for his comfort, or to the statesman who regards them in their bearing upon the weightiest of political considerations.

With equal justice, the value of the kinds of research whose results the volume records, is referred to in the words:

> Science employs, in effecting its progress, essentially the same methods that are used by merely practical men. Its success is commonly more rapid and brilliant, because its instruments of observation are finer and more skillfully handled; because it experiments more industriously and variedly, thus commanding a wider and more fruitful experience; because it usually brings a more cultivated imagination and a more disciplined judgment to bear upon its work. The devotion of a life to discovery or invention is sure to yield greater results than a desultory application made in the intervals of other absorbing pursuits. It is then for the interest of the farmer to avail himself of the labors of the man of science, when the latter is willing to inform himself in the details of practice, so as rightly to comprehend the questions which press for a solution.

We have lacked, and still lack, the science which our European neighbors, the Germans especially, have in such abundance. But, there is rising up among us a body of agricultural investigators who by their devotion, their ability, and their success, are proving that Americans do think of other things than the almighty dollar, and that American science has promise of vying with that of Europe; and the interest manifested by the public is of such sort as to make us believe that the fruits of their work will be appreciated in proportion to their value. With this to supplement our practical skill, the promise of the future is most encouraging.

In the early history of the Connecticut Experiment Station a young German chemist was employed as assistant. One of his associates, in attempting to give him an idea of the progress of agricultural chemistry in this country, which at that time amounted to but little, cited this book. The young German looked it through and remarked, "Why, this is a book for farmers." He had known in his own country the class of highly-educated agriculturists, numerous there, but at that time not common here, who would appreciate and utilize such works. In the fourteen years that have passed since that time, the number of farmers of this sort in the United States has wonderfully increased. But their growth has been no more rapid than that of the science in which they are interested.

When this book was first written, scarcely a dozen men in this country were devoting their whole time and thought to experimental researches in agricultural chemistry. The first agricultural experiment station, regularly organized as such, did not begin its work until eight years after the book was printed. The agricultural schools and colleges were still in their early struggle, and have not yet successfully asserted their place in our scheme of education. To-day we have a large number of such schools doing most useful work for agriculture, and recognized as emphatically successful. We have nearly fifty experiment stations, in which not far from four hundred specialists are devoting their energies to experimental inquiry in the different branches of agricultural science. As our first Secretary of Agriculture remarked, immediately after taking the oath of office, less than a year ago:

> In the history of no nation before has there been such a thirst for knowledge on the part of the great masses of the people, such high and just appreciation of its value, and such wide-reaching, successful, and popular schemes for self-education; no other nation has so large a body of farmers of high intelligence, never before has the great agricultural public been so willing, and indeed so anxious, to receive with respect and use with intelligence the information which science offers. Never before has science had so much to give.

Among the many influences which have helped on this really wonderful improvement may be included such works as "How Crops Grow," and the demand for this new edition ought certainly to be a large one.

The revising of such a work as "How Crops Grow" is a great undertaking. The book has been practically re-written, and is printed from entirely new plates. It is well illustrated, and embellished with a portrait of the distinguished author as a frontispiece. Typographically, the work has a setting worthy of its accuracy and completeness. Prof. Johnson has discharged an important duty to American agriculture in giving us this best product of his long and busy life. The book is as finished a literary production as it is standard in quality from both a practical and a scientific standpoint.

TIMBER AND SOME OF ITS DISEASES. By H. Marshall Ward, M. A., F. R. S., F. L. S. With Illustrations. London: Macmillan & Co. Pp. 295.

This is one of the volumes in the "Nature" series, Like the others of the series, it originated in articles published in the weekly which gives the series its distinctive title. The author is professor of botany in the Royal Indian Engineering College-Cooper's Hill, and has made minute and intelligent study of vegetable physiology, both normal and morbid. The book is both thoroughly scientific and thoroughly practical. It is full of interest and value to the botanist, the nurseryman, and to every one dealing or working in timber or lumber. The illustrations are remarkably clear and accurate, and the print is a delight to the eye. Sold by the Orange Judd Co. Price $1.75.

BLAKELEE'S INDUSTRIAL CYCLOPEDIA. A simple practical guide for the Mechanic, Farmer, Housewife, and Children of every thrifty Household in Town or Country. By George E. Blakelee. New York: The Baker and Taylor Co.

A book which serves as a sort of silent "guide, philosopher, and friend" in the household, and may be consulted in all unlooked-for contingencies, is what this work aims to be. Its author announces himself on the title-page as a "practical mechanic." He was for several years the editor of an agricultural paper, and has a fund of information on the every-day affairs of the farm and household. It is a manual of over seven hundred octavo pages, handsomely printed and illustrated. Sold by the Orange Judd Co. Price $3.00.

CALIFORNIA ILLUSTRATED. No. 1. The Vacaville Fruit District of California. By Edward J. Wickson. San Francisco. Pp. 149.

This is the first volume of a series which is designed to present, by description and colored plates, the appearance of the wonderful fruit regions of the Pacific coast. The present volume is devoted to the Vacaville valley, of which it gives a very vivid idea, by means of minute descriptions and twelve handsomely colored plates. Sold by the Orange Judd Co. Price $1.

READY, FEBRUARY 1st,

HOW CROPS GROW!

A Treatise on the Chemical Composition, Structure and Life of the Plant.

By PROFESSOR SAMUEL W. JOHNSON.

New Edition, Rewritten and Enlarged.

PRICE, TWO DOLLARS.

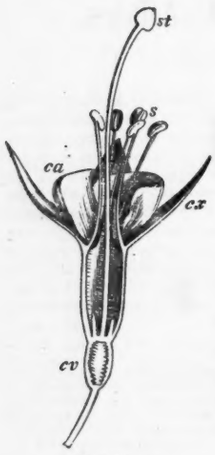


Fig. 61.
REPRODUCTIVE ORGANS OF PLANTS.

This great work has stood for nearly a quarter of a century as the standard authority in its field. For the past two years, Prof. Johnson has been engaged in revising it. The work has been practically rewritten throughout, and brought down to date, as containing the substance of all knowledge on the topics presented. A partial idea of the great value of this newly-revised book may be gained from the review printed in this issue of the AMERICAN AGRICULTURIST. Also from the following extracts from the

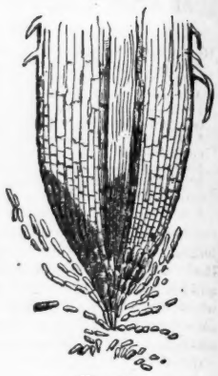


Fig. 36.
SLIP OF A BARLEY ROOT.

TABLE OF CONTENTS.

DIVISION I.—CHEMICAL COMPOSITION OF THE PLANT.

THE VOLATILE PART OF PLANTS—Distinctions and Definitions; Elements of the Volatile Part of Plants; Chemical Affinity; Vegetable Organic Compounds or Elements of Plants; Water; Carbhydrates; Vegetable Acids; Fats; Albuminoids and Ferments; Amides; Alkaloids; Phosphorized Substances.

THE ASH OF PLANTS—Ingredients of the Ash. *Non-metallic Elements:* Carbon and its Compounds; Sulphur and its Compounds. Phosphorus and its Compounds; Chlorine and its Compounds; Silicon and its Compounds. *Metallic Elements:* Potassium and its Compounds; Sodium and its Compounds; Calcium and its Compounds; Magnesium and its Compounds; Iron and its Compounds; Manganese and its Compounds. *Salts:* Carbonates; Sulphates; Phosphates; Chlorides; Nitrates.

QUANTITY, DISTRIBUTION, AND VARIATIONS OF THE ASH—Table of Proportions of Ash in Vegetable Matter; Special Composition of the Ash of Agricultural Plants; Constant Ingredients; Uniform Composition of Normal Specimens of Given Plants; Table of Ash-Analyses; Composition of Different Parts of Plants; Like composition of similar plants; Variability of ash of same species; What is normal composition of the ash of a Plant? To what extent is each ash-ingredient essential or accidental? Water Culture; Essential ash-ingredients; Is Sodium Essential to Agricultural Plants? Iron indispensable; Manganese unessential; Is Chlorine indispensable? Silica is not essential; Ash ingredients taken up in excess; Disposition of superfluous matters; State of Ash-ingredients in plant; Functions of the Ash-ingredients.

JUST HOW PLANTS GROW—Quantitative Relations among the Ingredients of Plants; Composition of the plant in successive stages of growth; Composition and Growth of the Oat Plant.

DIVISION II. THE STRUCTURE OF THE PLANT AND OFFICES OF ITS ORGANS.

GENERALITIES—Organism, Organs.

PRIMARY ELEMENTS OF ORGANIC STRUCTURE—The Vegetable Cell; Vegetable Tissues.

VEGETATIVE ORGANS—The Root; Offices of Root; Apparent Search for Food; Contact of Roots with Soil; Absorption by Root; Soil Roots, Water Roots, Air Roots; The Stem; Buds; Layers, Tillering; Root stocks; Tubers; Structure of the Stem; Endogenous Plants; Exogenous Plants; Sieve-cells; Leaves; Leaf Pores; Exhalation of Water Vapor; Offices of Foliage.

REPRODUCTIVE ORGANS—The Flower; Fertilization; Hybridizing; Species; Varieties; Fruit; Seed; Embryo; Vitality of seeds and their influence on the Plants they produce; Duration of Vitality; Use of old and unripe seeds; Density of seeds; Absolute weight of seeds; Signs of Excellence; Ancestry; Race-vigor.

DIVISION III. LIFE OF THE PLANT.

GERMINATION—Introductory; Phenomena of Germination; Conditions of Germination; Proper Depth of Sowing; Chemical Physiology of Germination; Chemistry of Malt.

FOOD OF THE PLANT when independent of the Seed; The Juices of the Plant; Their Nature and Movements; Flow of Sap; Composition of Sap; Kinds of Sap; Motion of Nutrient Matters; Causes of Motion of the Juices; Porosity of Tissues; Imbibition; Liquid Diffusion; Osmose or Membrane Diffusion; Root Action; Selective Power of Plant; Mechanical Effects of Osmose.

TABLE—Composition of Agricultural Products.

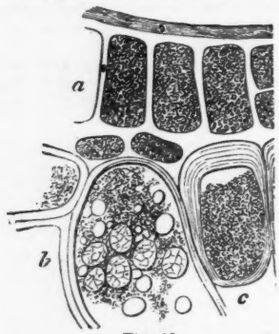


Fig. 18.
PART OF AN OAT KERNEL.

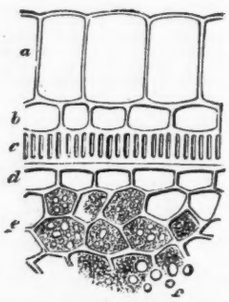


Fig. 19.
SECTION OF A FLAX SEED, SHOWING THE STARCH, OIL, ETC.

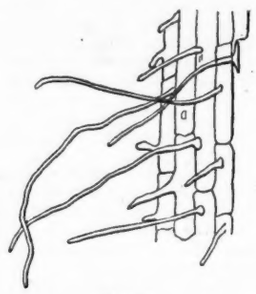


Fig. 39.
MINUTE PORTION OF A BARLEY ROOT, HIGHLY MAGNIFIED.

PROFUSELY ILLUSTRATED!

INDISPENSABLE TO THE FARMER!

THE STUDENT'S COMPANION!

Sent by Mail Postpaid on receipt of Price, $2.00.

THE COMPANION BOOK, BY THE SAME AUTHOR,

How Crops Feed.

PRICE, BY MAIL, POST-PAID, $2.00.

ORANGE JUDD CO., 751 Broadway, New York.

GARDENING FOR PLEASURE.

A Guide to the Amateur in the Fruit, Vegetable, and Flower Garden, with full Directions for the Greenhouse, Conservatory, and Window Garden.

BY PETER HENDERSON,

Author of "Gardening for Profit," "Practical Horticulture," "Hand Book of Plants," "Garden and Farm Topics," "How the Farm Pays."

NEW AND ENLARGED EDITION.

The author's aim in writing this book was to make it such as would be useful to the occupant of a city lot, or to the possessor of a few window plants, as well as to the owner of a country residence that is fully appointed in all matters relating to the cultivation of flowers, fruits, and vegetables.

CONTENTS.

Introduction. Preface. Location and Soil. Drainage. Preparation of the Ground. Walks. (Salt to Kill Weeds). Manures. How to use Concentrated Fertilizers. Special Fertilizers for Particular Plants. The Lawn (on Slope; Ants on; Weeds on). Design for Garden. Planting of Lawns and Flower Beds. Fall or Holland Bulbs. The Bermuda Easter Lily. Lily of the Valley, and Tuberoses. Lilium, Hardy, Garden, and Callas. Gladiolus and Amaryllis. Cyclamens. Propagation of Plants by Seeds. Propagation of Plants by Cuttings. Propagation of Plants by Layering. Parasites Injurious to Plants. Frozen Plants. Mulching. Shading. Nature's Law of Colors. Humbugs in Horticulture. Fruit Garden. Pruning. Hardy Grapes—List of Cold Grapery. Forcing Grapery. The Strawberry. The Strawberry—Varieties of. The Strawberry—Forcing of. The Raspberry. The Blackberry. The Currant. The Gooseberry. The Quince. The Cherry. The Plum. The Japan Persimmon. The Peach. The Nectarine. The Apricot. The Apple. The Pear. Cottage Gardening—a Digression. Vegetable Garden. Asparagus. Artichoke, Globe. Artichoke, Jerusalem. Beans, Dwarf or Bush. Beans, Pole or Running. Beet. Borecole or Kale. Broccoli. Brussels Sprouts. Cauliflower. Cabbage. Carrot. Celery. Celeriac. Corn Salad. Chives. Cress. Cress, Water. Corn, Sugar. Cucumber. Cucumber Forcing. Egg Plants. Endive. Garlic. Horseradish. Kohl-rabi and Leek. Lettuce. Martynia. Melon, Musk. Melon, Water. Mushroom. Okra. Nasturtium. Onion. Parsley. Parsnip. Peas. Pepper. Potato. Pumpkin. Radish. Rhubarb. Salsify. Scorzonera. Sea Kale. Schallots. Spinach. Spinach—Substitute for Swiss Chard and New Zealand. Squash. Sweet Potato. Succession Crops of Vegetables. Tomato. Turnip. General Instructions. Implements. Monthly Calender of Operations. Budding and Grafting. How Budding and Grafting are Done. Treating of Tropical Bulbs and Seeds. Potting of Plants. Winter Flowering Plants. Unhealthy Plants—The Remedy. Garden Culture of the Rose. Rose Growing in Winter. Orchids. Plants Suited for Summer Decoration. Annual Seeds—How to Sow. Annual Seeds—List of. Hanging Baskets. Window Gardening. Parlor Gardening, or Cultivation of Plants in Rooms. Culture of Water Lilies and other Aquatic Plants. Wardian Cases, Ferneries and Jardinieres. Chrysanthemums. Are Plants in Rooms Injurious to Health? Greenhouses Attached to Dwellings. Detached Greenhouse Structures. Glass and Glazing. Heating by Hot Water and Steam. Heating by Flues. Hot-Beds. Greenhouses or Pits without Artificial Heat. Combined Cellar and Greenhouse. Hardy Shrubs, Trees and Climbers. Twining and Clinging Climbers. Hardy Herbaceous Perennials. What Flowers will Grow in the Shade. Insects and

ILLUSTRATED. Price, Post-paid, $2.00. ORANGE JUDD CO., 751 Broadway, New York.

Practical Floriculture.

A GUIDE TO THE SUCCESSFUL PROPAGATION AND CULTIVATION OF

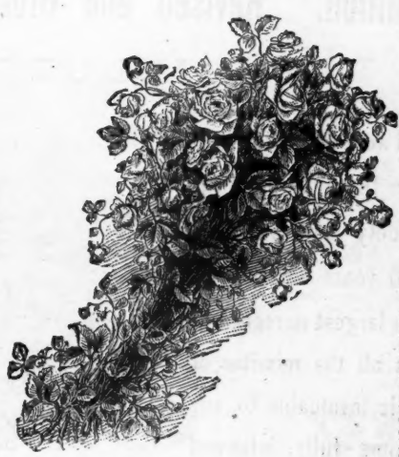
FLORISTS' PLANTS.

BY PETER HENDERSON,

Author of "Gardening for Profit" and "Gardening for Pleasure."

NEW AND ENLARGED EDITION.

Mr. Henderson is known as the largest Commercial Florist in the country. In this new and enlarged edition of this work, he gives a full account of his modes of propagation and cultivation. It is adapted to the wants of the amateur as well as the professional grower. The scope of the work may be judged from the following table of



CONTENTS.

How to Become a Florist.—The prices of Nursery and Greenhouse Products Abroad and at Home.—The Profits of Floriculture.—Aspect and Soil.—The Preparation for New, and the Renovation of Old Lawns.—Laying out the Flower Garden.—Designs for Ornamental Grounds and Flower Gardens.—Planting of Flower Beds.—Soils for Potting.—Temperature and Moisture.—The Potting of Plants.—Drainage in Pots.—Expert Garden Workmen.—Cold Frames.—Winter Protection.—The construction of Hot Beds.—Greenhouse Structures.—Wide Greenhouses for Bedding Plants and Rose Growing.—Glass, Glazing and Shading.—Modes of Heating.—Heating by Steam.—Base Burning Water-Heater.—Rocks.—Are Plants Injurious to Health?—The Injury to Plants by Forcing.—Nature's Law of Colors.—What Flowers will Grow in the Shade?—Succession Crops in the Greenhouse.—Packing Plants.—Plants by Mail.—Insects and Diseases affecting Plants.—Mildew.—Diary of Operations for the Year.—The Culture of Grape-Vines under Glass. Propagation of Plants by Seeds.—Propagation by Seeds.—What Varieties Come True from Seeds?—Propagation of Plants by Cuttings.—"Saucer System" of Propagation.—Propagating Soft-Wooded Plants in Summer.—Propagation of Roses by Cuttings.—Propagating Roses by Grafting and Budding.—Greenhouse Plants Most in Demand in Market in Spring.—The Cultivation of the Verbena.—Cold-Frame Plants Most Sold in Market in Spring.—Plants Most in Demand for Window Decoration in Winter.—Culture of Winter-Flowering Plants for Cut Flowers.—Rose Growing in Winter.—Bulbs for Winter Flowers.—Violets, Chrysanthemums, Carnations, and Mignonette.—Bouvardias, Stevias, Eupatorium, Heliotropes, Poinsettia, and other Winter-Flowering Plants.—Orchids.—Chinese Primrose, Geranium, Camellia and Eucharis.—Plants Used for Foliage.—Smilax, Asparagus, Ferns, etc.—Plants used for Decoration of Rooms.—General Collection of Plants Grown Under Glass.—Construction of Bouquets, Baskets, etc.—Hanging Baskets.—Parlor or Window Gardening.—Formation of Rock-Work, and Plants for

ILLUSTRATED. Price, Post-paid, $1.50. ORANGE JUDD CO., 751 Broadway, New York.

GARDENING FOR PROFIT.

THE BEST BOOK ON GARDENING EVER WRITTEN.

A GUIDE TO THE SUCCESSFUL CULTURE OF THE MARKET AND FAMILY GARDEN.

PROFUSELY ILLUSTRATED!

Entirely Rewritten and Greatly Enlarged.

By PETER HENDERSON,

Author of "Practical Floriculture," "Gardening for Pleasure," "Garden and Farm Topics," etc.

The immense and unprecedented sale of the earlier editions of Mr. Henderson's book, "Gardening for Profit," which sale has been continuous since the first day of its issue, indicates the estimate of its value as a thoroughly practical work. The new book, just issued, contains the best of the former work, with large additions drawn from the author's added years of experience. It cannot but be regarded by all as the best work on Market and Family Gardening ever published.

WHAT MR. HENDERSON SAYS ABOUT THE NEW WORK:

A NEW EDITION OF GARDENING FOR PROFIT.

It is twenty years since I first wrote Gardening for Profit. It is gratifying to know that its teachings have been the means of helping to success thousands of inexperienced cultivators of the soil. That the present edition will continue to do so I have no doubt, for it has not only been greatly widened in its range, but besides contains my added experience f twenty years since the time of its first writing.

The scope of the new edition of Gardening for Profit has been greatly extended, embracing, as it does, not only the forcing of all important Fruits and Vegetables under glass, but also detailing the methods of culture of all small fruits which properly come under the head of "Gardening for Profit."

Although the profits of Maket Gardening are not so great as they were twenty years ago, it is yet far more profitable than farm operations, for the capital and labor invested. There are thousands of farms adjacent to the smaller towns and villages, hotels and watering places, where, if the farmer would devote a few acres to Fruits and Vegetables, the chances are that he would find it ten times more profitable than the same amount of labor done on the farm.

Although this new edition of Gardening for Profit is written mainly for the Market Gardener, the Amateur interested in Vegetables or Fruits can easily adapt its teachings to the smaller requirements. PETER HENDERSON.

PRICE, POST-PAID, $2.00. **ORANGE JUDD CO., 751 Broadway, New York.**

BARRY'S FRUIT GARDEN.

By P. BARRY.

New Edition. Revised and Brought Down to Date by the Author.

ILLUSTRATED.

This is the standard work upon the Fruit Garden. It is written from the practical experience of the widely known author, who for more than 30 years has been at the head of one of the largest nurseries in America. It explains all the minutiæ of fruit-gardening, and is invaluable to any one who would become fully informed upon the subject of which it treats.

CONTENTS.

PART I.—General Principles.—Names, Descriptions and offices of the different Parts of Fruit Trees.—Soils.—Manures.—The Different Modes of Propagating Fruit Trees.—Pruning, its Principles and Practice.

PART II.—The Nursery.—Soil, Situation, etc.

PART III.—The Laying out, Arrangement and General Management of Permanent Plantations of Fruit Trees, Selection of Trees and Varieties, and Pruning and Conducting Trees Under Various Forms.

PART IV.—Abridged Description of Select Varieties of Fruits.—Gathering, Packing, Transportation, and Preservation of Fruits.—Diseases and Insects.—Nursery, Orchard and Fruit Garden Implements.

PRICE, POST-PAID, $2.00. **ORANGE JUDD CO., 751 Broadway, New York.**

CONDENSED LIST OF BOOKS FOR FARMERS & OTHERS.

Any of these books will be sent post-paid on receipt of price.

Farm and Garden.

Allen's (R. L. & L. F.) New American Farm Book.....$2 50
Asparagus Culture.....Flex. Cloth.. 50
Bamford's Silk Culture.....Paper.. 30
Barry's Fruit Garden. New and Revised Edition..... 2 00
Beal's Grasses of North America..... 2 50
Bommer's Method of Making Manure..... 25
Brackett's Farm Talk.....Paper, 50 cts.; Cloth.. 75
Brill's Cauliflowers..... 20
Brill's Farm-Gardening and Seed-Growing..... 1 00
Broom-Corn and Brooms..... 50
Curtis on Wheat Culture.....Paper.. 50
Emerson & Flint's Manual of Agriculture..... 1 50
Farm Appliances..... 1 00
Farm Conveniences..... 1 50
Farming for Boys..... 1 25
Farming for Profit..... 3 75
Fences, Gates and Bridges..... 1 00
Fitz's Sweet Potato Culture..... 60
Flax Culture. [Seven Prize Essays by practical growers.] 30
Flint's Grasses and Forage Plants..... 2 00
French's Farm Drainage..... 1 50
Fuller's Practical Forestry..... 1 50
Gregory on Cabbages..... 30
Gregory on Carrots, Mangold Wurtzels, etc..... 30
Gregory on Fertilizers..... 40
Gregory on Onion Raising..... 30
Gregory on Squashes..... 30
Harris' Gardening for Young and Old..... 1 00
Harris' Talks on Manures. New and Revised Edition.. 1 75
Henderson's Garden and Farm Topics..... 1 50
Henderson's Gardening for Pleasure..... 2 00
Henderson's Gardening for Profit..... 2 00
Henderson & Crozier's How the Farm Pays..... 2 50
Hop Culture. New and Revised Edition..... 30
Johnson's How Crops Feed..... 2 00
Johnson's How Crops Grow..... 2 00
Johnson's How to Plant.....Paper.. 50
Jones' Peanut Plant.....Paper.. 50
Lawn Planting.....Paper.. 25
Leland's Farm Homes, In-Doors and Out-Doors..... 1 50
Long's Ornamental Gardening..... 2 00
Morton's Farmer's Calendar..... 5 00
Norton's Elements of Scientific Agriculture..... 75
Oemler's Truck-Farming at the South..... 1 50
Onions—How to Raise them Profitably..... 20
Our Farm of Four Acres.....Paper.. 30
Pabor's Colorado as an Agricultural State..... 1 50
Pedder's Land Measurer for Farmers..... 60
Plant Life on the Farm..... 1 00
Quinn's Money in the Garden..... 1 50
Register of Rural Affairs, bound, 9 vols., each..... 1 50
Riley's Potato Pests.....Paper.. 50
Robinson's Facts for Farmers..... 5 00
Roe's Play and Profit in My Garden..... 1 50
Roosevelt's Five Acres Too Much..... 1 50
Silos, Ensilage and Silage..... 50
Starr's Farm Echoes..... 1 00
Stewart's Irrigation for the Farm, Garden and Orchard 1 50
Storer's Agriculture in some of its Relations with Chemistry. Two Volumes..... 5 00
Ten Acres Enough..... 1 00
The Soil of the Farm..... 1 00
Thomas's Farm Implements and Machinery..... 1 50
Tim Bunker Papers; or, Yankee Farming..... 1 50
Tobacco Culture. By fourteen experienced cultivators. 25
Treat's Injurious Insects of the Farm and Garden..... 2 00
Villes' Artificial Manures..... 6 00
Villes' High Farming without Manures..... 25
Villes' School of Chemical Manures..... 1 25
Waring's Book of the Farm..... 2 00
Waring's Draining for Profit and Health..... 1 50
Waring's Elements of Agriculture..... 1 00
Waring's Sanitary Drainage of Houses and Towns..... 2 00
Waring's Sanitary Condition in City and Country Dwellings..... 50
Warington's Chemistry of the Farm..... 1 00
Weid's and Others' A B C of Agriculture..... 50
White's Gardening for the South..... 2 00

Fruits and Flowers.

Bailey's Field Notes on Apple Culture..... 75
Black's The Cultivation of the Peach and the Pear on the Delaware and Chesapeake Peninsula..... 1 50
Charlton's Grape Grower's Guide..... 75
Culbert's Sorghum, its Culture and Manufacture..... 3 00
Common Sea Weeds.....Boards.. 50
Downing's Fruits and Fruit Trees of America. New ed. 5 00
Elliott's Hand Book for Fruit Growers..... 1 00
Every Woman Her Own Flower Gardener..... 1 00
Fern Book for Everybody..... 50
Fuller's Grape Culturist..... 1 50
Fuller's Illustrated Strawberry Culturist..... 25
Fuller's The Propagation of Plants..... 1 50
Fuller's Small Fruit Culturist. New Edition..... 1 50
Fulton's Peach Culture. New and Revised Edition..... 1 50
Heinrich's Window Flower Garden..... 75
Henderson's Hand Book of Plants..... 3 00
Henderson's Practical Floriculture..... 1 50
Hibbard's Amateur Flower Garden..... 2 50
Hibbard's Amateur Greenhouse and Conservatory..... 2 50
Hibbard's Amateur Rose Book..... 2 50
Husmann's American Grape Growing & Wine Making. 1 50
Johnson's Winter Greeneries at Home..... 1 00
Meech's Quince Culture..... 1 00
Moore's Orange Culture..... 1 00
My Vineyard at Lakeview..... 1 25
Origin of Cultivated Plants..... 1 75
Parsons on the Rose. New and Revised Edition..... 1 00
Quinn's Pear Culture for Profit..... 1 00
Rivers's Miniature Fruit Garden..... 1 00
Rixford's Wine Press and Cellar..... 1 50
Robinson's Ferns in Their Homes and Ours..... 1 50
Roe's Success with Small Fruits..... 2 50
Sheehan's Your Plants.....Paper.. 40
Saunder's Insects Injurious to Fruits..... 2 00
Stewart's Sorghum and its Products..... 1 50
Thomas's American Fruit Culturist. New Edition..... 2 00
Vick's Flower and Vegetable Garden..... 1 50
Webb's Cape Cod Cranberries.....Paper.. 40
White's Cranberry Culture..... 1 25
Williams' Orchid Grower's Manual..... 6 50
Wood's Modern Window Gardening..... 1 25

Horses, Riding, etc.

Anderson's Modern Horsemanship..... 7 00
Anderson's The Galop..... 1 00
Armatage's Every Man His Own Horse Doctor. 8vo.. 7 50
Armatage's Horse Owner and Stableman's Companion. 1 50
Battersby's The Bridle Bits. A valuable work..... 1 00
Baucher's New Method of Horsemanship..... 1 00
Chawner's Diseases of the Horse..... 1 25
Dadd's American Reformed Horse Book. 8vo..... 2 50
Dadd's Modern Horse Doctor. 12mo..... 1 50
Day's The Race Horse in Training..... 3 00
Du Hays' Percheron Horse. Revised and Enlarged..... 50
Gleason's How to Handle and Educate Vicious Horses. 50
Hayseed; Or, How to Develop Speed in Trotters and Pacers, and How to Steer them in a Race..... 1 00
Heatley's Every Man his Own Veterinarian..... 2 50
Herbert's Hints to Horse-Keepers..... 1 75
Horse, The; Its Varieties and Management....Boards.. 75
Howden's How to Buy and Sell the Horse..... 1 00
Jennings' Horse Training Made Easy..... 1 00
Jennings on the Horse and his Diseases..... 1 25
Law's Farmers' Veterinary Adviser..... 3 00
Llautard's Chart of Age of Domestic Animals..... 50
Llautard's Animal Castration..... 2 00
Magner's The Art of Taming and Educating the Horse 5 00
" " " " " Sheep 6 00
Manning's The Illustrated Stock Doctor..... 4 25
Martin's The Family Horse..... 1 00
Mayhew's Illustrated Horse Doctor..... 3 00
Mayhew's Illustrated Horse Management..... 3 00
McClure's American Gentleman's Stable Guide..... 1 00
McClure's Diseases of American Horses..... 2 00
Rarey and Knowlson's Complete Horse Tamer..... 50
Riding and Driving..... 30
Riley on the Mule..... 1 50
Russell's Scientific Horse-Shoeing..... 3 00
Saddle Horse, The; Complete Guide to Riding and Training..... 1 00
Saunder's Horse Breeding..... 2 00
Stewart's American Farmer's Horse Book..... 3 00
Stonehenge's Every Horse Owner's Cyclopædia..... 2 75
Stonehenge on the Horse in Stable & Field, Eng. Ed. 8vo. 3 50
Stonehenge on the Horse in Stable & Field, Am. Ed. 12mo. 2 00
Tellor's Diseases of Live Stock. Cloth, $2.50; Sheep... 3 00
Williams' Veterinary Medicine..... 5 00
Williams' Veterinary Surgery..... 7 50
Woodruff's Trotting Horse of America..... 2 50
Wood's Horse and Man..... 2 50
Youatt and Skinner on the Horse..... 1 75
Youatt and Spooner on the Horse..... 1 50

Cattle, Sheep, and Swine.

Allen's (L. F.) American Cattle. New and Revised Ed. 2 50
Armatage's Every Man His Own Cattle Doctor. 8vo... 7 50
Armsby's Manual of Cattle Feeding..... 2 50
Cattle: The Varieties, Breeding and Management..... 75
Clok's Diseases of Sheep.....Paper.. 75
Coburn's Swine Husbandry. New and Revised Ed..... 1 75
Dadd's American Cattle Doctor. 12mo..... 1 50
Dadd's American Cattle Doctor. 8vo..... 2 50
Fleming's Veterinary Obstetrics..... 6 00
Guenon on Milch Cows. New and Revised Edition..... 1 00
Harris on the Pig..... 1 00
Jennings on Cattle and their Diseases..... 1 25
Jennings on Sheep, Swine, and Poultry..... 1 25
Jersey, Alderney, and Guernsey Cow..... 1 00
Keeping One Cow. New and Revised Edition..... 1 00
Macdonald's Food from the Far West..... 1 00
McClure's Diseases of the Am. Horse, Cattle & Sheep... 1 25
McCombie's Cattle and Cattle Breeders..... 1 50
Martin's Hog-Raising and Pork-Making..... 40
Miles' Stock Breeding..... 1 50
Murray's Cattle and their Diseases..... 2 50
Powers' The American Merino for Wool and Mutton. A practical and valuable work..... 1 50
Randall's Fine Wool Sheep Husbandry..... 1 00
Randall's Practical Shepherd..... 2 00
Shepherd's Prairie Experience in Handling Cattle..... 1 00
Stewart's Feeding Animals..... 2 00
Stewart's Shepherd's Manual..... 1 50
Stewart's The Dairyman's Manual..... 2 00
The Sheep: Its Varieties and Management. Boards... 75
Willard's Practical Butter Book..... 1 00
Willard's Practical Dairy Husbandry..... 3 00
Youatt and Martin on the Hog..... 1 00
Youatt on Sheep..... 1 00

Dogs, etc.

Dinks, Mayhew, and Hutchinson, on the Dog..... 3 00
Dog, by Hill..... 4 00
Dog, The: Its Varieties and Management. Boards.... 50
Dog, The, by Idstone..... 1 25
Dogs of Great Britain, America, and other Countries.. 2 00
Dogs, Scale of Points in Judging..... 50
Floyd's Hints on Dog Breaking..... 50
Hallock's Dog Fanciers' Directory..... 25
Hammond's Dog Training..... 1 00
Hutchinson's Dog Breaking..... 3 00
Laverack's The Setter..... 3 00
Mayhew's Dogs; Their Management..... 75
Shaw's Illustrated Book of the Dog..... 3 00
Stables' Practical Kennel Guide..... 1 50
Stables' Ladies' Dogs as Companions..... 2 00
Stables, Our Friend, the Dog..... 3 00
Stonehenge, Dogs, British Islands. New Edition..... 6 00
Stonehenge on the Dog..... 2 50
Stonehenge's The Greyhound..... 5 50
Youatt's On the Dog..... 2 50

Poultry and Bees.

Burnham's New Poultry Book..... 1 50
Cook's Bee-Keeper's Guide, or Manual to the Apiary... 1 50
Cooper's Game Fowls..... 3 00
Felch's Poultry Culture..... 1 50
Johnson's Practical Poultry Keeper.....Paper.. 50
King's Bee-Keeper's Text Book..... 1 00
Langstroth's On the Honey and Hive Bee..... 2 00
Lucas' The Pleasures of a Pigeon Fancier..... 1 50
Newman's Bees and Honey.....Paper, 75; Cloth.. 1 00
Poultry: Breeding, Rearing, Feeding, etc.....Boards.. 50
Profits in Poultry and their Profitable Management. Most complete Work extant..... 1 00
Quinby's Mysteries of Bee-Keeping Explained (Edited by L. C. Root)..... 1 50
Renwick's Thermostatic Incubator..... 1 25
Root's A B C of Bee Culture..... 1 00
Standard of Perfection in Poultry..... 1 00
Stoddard's An Egg Farm. Revised and Enlarged..... 50
Wright's Illustrated Book of Poultry..... 5 00
Wright's Practical Pigeon Keeper..... 1 50
Wright's Practical Poultry Keeper..... 2 00

Architecture and Landscape Gardening.

Ames' Alphabets..... 1 50
American Cottages..... 5 00
Atwood's Country and Suburban Houses..... 1 50
Barn Plans and Out-Buildings..... 1 50
Bell's Carpentry Made Easy..... 5 00
Bicknell's Cottage and Villa Architecture..... 6 00
Bicknell's Detail Cottage & Constructive Architecture. 6 00
Bicknell's Modern Architectural Designs and Details.. 6 00
Bicknell's Public Buildings. New..... 2 50
Bicknell's School-House and Church Architecture..... 2 50
Bicknell's Stables, Out-Buildings, Fences, etc..... 2 50
Bicknell's Street, Store, and Bank Fronts. New..... 2 50
Brown's Building, Table and Estimate Book..... 1 50
Burns' Architectural Drawing Book..... 1 00
Burns' Illustrated Drawing Book..... 1 00
Burns' Ornamental Drawing Book..... 1 00
Cameron's Plasterer's Manual..... 75
Camp's How Can I Learn Architecture..... 50
Copley's Plain and Ornamental Alphabets..... 2 00
Cottages, Hints on Economical Building..... 1 00
Cummings' Architectural Details.....
Elliott's Hand-Book of Practical Landscape Gardening. 1 50
Eveleth's School-House Architecture..... 4 00
Fuller's Artistic Homes..... 4 50
Gillmore's Roads and Street Pavement..... 2 50
Gould's American Stair-Builder's Guide..... 2 50
Gould's Carpenter's and Builder's Assistant..... 2 50
Harney's Barns, Out-Buildings and Fences..... 4 00
Hodgson's Steel Square..... 1 00
Holly's Art of Saw Filing..... 75
Holly's Carpenters' and Joiners' Hank-Book..... 75
Homes for Home Builders..... 1 50
Hulme's Mathematical Drawing Instruments..... 1 50
Hussey's Home Building..... 2 50
Hussey's National Cottage Architecture..... 4 00
Interiors and Interior Details.....
Lakey's Village and Country Houses..... 5 00
Modern House Painting..... 3 00
Monckton's National Carpenter and Joiner..... 5 00
Monckton's National Stair-Builder..... 5 00
Painter, Gilder, and Varnisher's Companion..... 1 50
Palliser's American Cottage Homes..... 4 00
Palliser's Model Homes..... 1 00
Palliser's Useful Details..... 2 00
Plummer's Carpenters' and Builders' Guide..... 75
Powell's Foundations and Foundation Walls..... 2 00
Reed's Cottage Houses..... 1 25
Reed's Dwellings for Village and Country..... 2 50
Reed's House Plans for Everybody..... 1 50
Riddell's New Elements of Hand Railing.....
Riddell's Lessons on Hand Railing for Learners.....
Rural Church Architecture..... 4 00
Scott's Beautiful Homes..... 2 50
Tuthill's Practical Lessons in Architectural Drawing.. 2 50
Weidenmann's Beautifying Country Homes. A superb quarto volume. 24 lithograph plates, in colors.....10 00
Woodward's Cottages and Farm Houses..... 1 00
Woodward's Country Homes..... 1 00
Woodward's National Architect. Vols. 1 & 2.....15 00
Woodward's Suburban and Country Houses..... 1 00

Angling, Fishing, etc.

Angling: Trolling, Spinning, Bottom and Fly Fishing.. 50
A Book of the Running Brook and of Still Waters. By Lady Colin Campbell..... 1 25
Frank Forester's Fish and Fishing..... 2 50
Hamilton's Fly Fishing for Salmon and Trout..... 1 75
Harris' Scientific Angler—Foster..... 1 50
Henshall's Book of the Black Bass..... 3 00
Keene's Fly-Fishing and Fly-Making..... 1 50
King's Trouting on the Brule River..... 1 50
Orvis' Fishing with the Fly..... 2 50
Roosevelt's Game Fish of the North. New & Rev. Ed.. 2 00
Roosevelt's Superior Fishing. New and Rev. Edition.. 2 00
Roosevelt & Green's Fish Hatching and Fish Catching. 1 50
Scott's Fishing in American Waters. 8vo..... 5 00
Slack's Practical Trout Culture..... 1 00

Boating, Canoeing, Sailing, etc.

Frazar's Practical Boat Sailing..... 1 00
Prescott's Sailing Boat..... 25

Field Sports and Natural History.

American Bird Fancier. Enlarged Edition..... 50
American Ornithology. (Wilson & Bonaparte)..... 7 50
Bailey's Our Own Birds..... 1 50
Brown's Taxidermist's Manual..... 1 00
Canary Birds. New and Revised Ed. Paper, 50c.; cloth. 75
Frank Forester's Field Sports. 2 vols..... 4 00
Packard's Guide to the Study of Insects..... 5 00
Stonehenge's Encyclopædia of Rural Sports.....

Hunting, Shooting, etc.

Amateur Trapper and Trap Makers' Guide. pa., 50c.; bds. 75
Barber's Crack Shot..... 1 25
Batty's Practical Taxidermy and Home Decoration..... 1 50
Batty's How to Hunt and Trap. New and enlarged Ed.
Bogardus' Field, Cover and Trap Shooting..... 2 00
Bumstead's Shooting on the Wing..... 1 50
Leffingwell's Wild Fowl Shooting..... 2 50
Murphy's American Game Bird Shooting..... 2 00
Pistol, The—How to Use..... 50
Practical Hints on Rifle Practice with Military Arms.. 25
Roosevelt's Florida, and Game Birds of the North. New and Revised Edition..... 2 00
Smith's Law of Field Sports..... 1 00
Thrasher's Hunter and Trapper..... 75

Miscellaneous.

Clingman's Tobacco Remedy..... 25
Collection of Ornaments..... 2 00
Common Sea Weeds..... 50
Common Shells of the Sea Shore..... 50
Corson's Twenty-five Cent Dinners..... 25
De Voe's Market Assistant..... 2 50
Eggleston's Circuit Rider.....
Eggleston's End of the World..... 1 50
Eggleston's Hoosier School-Master..... 1 25
Eggleston's Hoosier School-Boy.....
Eggleston's Mystery of Metropolisville..... 1 50
Eggleston's Queer Stories.....
Eggleston's Roxy.....
Green's Home Fishing and Home Waters..... 50
Hill's From Home to Home..... 4 00
Holden's Book of Birds.....Paper.. 25
Household Conveniences..... 1 50
How to Make Candy..... 50
How to Detect the Adulterations of Food.....Paper.. 25
Leary's Ready Reckoner..... 25
Menhaden: Its Uses, etc. Goode & Atwater..... 2 00
Mrs Ellett's Housewife. New and Revised Edition.. 1 25
Our Homes; How to Beautify them..... 1 00
Scribner's Lumber and Log Book..... 35
The Model Cook..... 1 00
Wingate's Through the Yellowstone Park on Horseback..... 1 50

ORANGE JUDD COMPANY, Publishers and Importers of all Works Pertaining to Rural Life,
751 BROADWAY, NEW YORK.

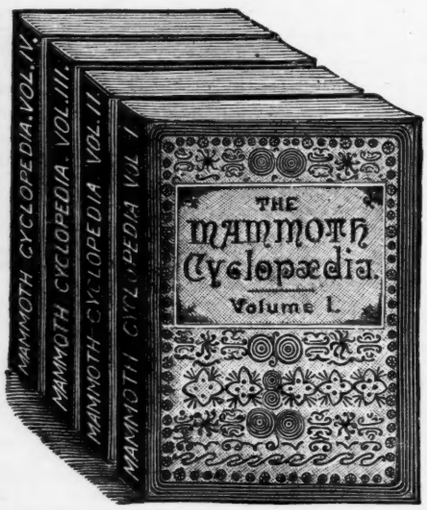
OUR GREAT PREMIUM FOR 1890.

THE MAMMOTH CYCLOPEDIA.

A Great and Wonderful Work in 4 Volumes.

2176 PAGES! 620 ILLUSTRATIONS!

SENT FREE TO SUBSCRIBERS TO THE AMERICAN AGRICULTURIST. SEE PARTICULARS BELOW.



THE MAMMOTH CYCLOPEDIA has been published to meet the wants of the masses for a **universal compendium of knowledge, practical, useful, scientific and general.** The work is published complete in **four large volumes,** neatly bound in paper covers, comprising a total of **2176 pages,** and is **profusely illustrated** with **620 engravings. Thousands of dollars** have been expended to make this the **most complete, valuable** and **useful work** for the masses ever published. **It is a work for everybody**—man, woman and child, in every occupation or walk in life. The substance and practical utility of 20 ordinary volumes are comprised in these four, and so replete is the work with knowledge of every kind, so filled is it with useful hints and helpful suggestions, that we fully believe that in every home to which it shall find its way it will soon come to be regarded as WORTH ITS WEIGHT IN GOLD. For want of space we can only briefly summarize a small portion of the contents of this great work, as follows:

HISTORY. THE MAMMOTH CYCLOPEDIA contains a **complete and authentic history** of the great **American Civil War,** profusely illustrated, with numerous Anecdotes of the Rebellion; **a complete History of America,** from its discovery by Columbus to the present time; graphic descriptions of famous battles and important events in the history of all nations, chronological history, etc., etc.

BIOGRAPHY. This great work contains the **Lives** of all the **Presidents** of the **United States from Washington to Harrison,** with portraits and other illustrations, also lives and portraits of Napoleon Bonaparte, Shakespeare, Byron, William Penn, Benjamin Franklin, Henry Clay, Daniel Webster, and famous statesmen, authors, poets, generals, clergymen, etc., down to the present day.

AGRICULTURE. **Valuable hints and useful suggestions to farmers,** treating of **field crops, gates and fences, fertilizers, farm implements; live-stock raising,** including the treatment of **diseases of domestic animals;** poultry keeping, and how made successful and profitable; bee keeping, dairy farming, etc. The treatment of these subjects is complete and exhaustive, and renders the work of great practical use to farmers and stockmen.

HORTICULTURE. Herein is given the most **useful hints to growers** of all kinds of **vegetables and fruits,** as gathered from the **experience** of the most **successful horticulturists.**

ARCHITECTURE. **Designs and plans for houses, cottages, barns,** and other **outbuildings,** with valuable suggestions to those intending to build.

HOUSEHOLD. This great work contains **tried and tested recipes** for almost every imaginable dish for **breakfast, dinner and tea,** this department alone being worth more than nine-tenths of the cook books sold; almost innumerable **hints, helps and suggestions to housekeepers;** designs and suggestions for making many **beautiful things for the adornment of home, in needlework, embroidery,** etc.; **hints on floriculture,** telling how to be successful with all the various plants; **toilet hints,** telling how to **preserve and beautify the complexion,** hands, teeth, hair, etc., etc.

MEDICAL. **Many dollars in doctors' bills** and patent medicines will be **saved annually** to every possessor of this book through the **valuable information** herein contained. It tells how to cure, by simple yet reliable home remedies, available in every household, every disease and ailment that is curable, this department forming a complete medical book, the value of which in any home can hardly be computed in dollars and cents.

INVENTION AND DISCOVERY. Remarkably **interesting descriptions of great inventions,** including the Steam Engine, the Telegraph, the Printing Press, the Electric Light, the Sewing Machine, the Telephone, the Type Writer, the Type Setting Machine, the Cotton Gin, etc.

THE WORLD'S WONDERS. **Graphic descriptions, beautifully illustrated,** of the **Yellowstone Park, Yosemite Valley,** Niagara Falls, the Alps, Paris, Vesuvius, Venice, Vienna, the Canons of Colorado, Mammoth Cave, Natural Bridge, Watkins Glen, the White Mountains, etc., etc.

TRAVELS. **Descriptions, profusely illustrated,** of the **life, manners, customs,** peculiar forms, rites and ceremonies, of the Chinese, Japanese, the people of India, Africa, Madagascar, Palestine, Iceland, Borneo, Burmah, the Sandwich Islands, Servia, Kaffraria, Tartary, Cashmere and Tunis, the Arabs, Turks, Mexicans, South Americans, American Indians, Egyptians, Siamese, Abyssinians, Norwegians, Spaniards, Swiss, Italians, Greeks, Russians, Siberians, Afghans, Persians, Moslems Australians, Bulgarians, Sicilians, etc., etc.

MANUFACTURES. In this great work is also described and illustrated the arts and processes of printing, stereotyping, bookbinding, wood engraving, lithography, photography, calico printing, piano making, watch making, paper making, the manufacture of silk, iron, steel, glass, china, perfumery, soap, leather, starch, wall paper, turpentine, postal cards, postage stamps, envelopes, pens, pencils, needles, and many other things, all of which will be found peculiarly interesting and instructive.

FOREIGN PRODUCTS. Interesting descriptions, illustrated, of the **culture and preparation** for market of **tea, coffee, chocolate,** cotton, **flax,** hemp, sugar, rice, nutmegs, clover, ginger, cinnamon, allspice, pepper, cocoanuts, pineapples, bananas, prunes, dates, **raisins,** figs, olives, india rubber, gutta percha, cork, camphor, castor oil, tapioca, etc., etc.

NATURAL HISTORY. Interesting and instructive descriptions, accompanied by illustrations, of numerous beasts, birds, fishes and insects, with much curious information regarding their life and habits.

LAW. The **Mammoth Cyclopedia** is also **a complete law book,** telling every man how he may be his **own lawyer,** and containing **full** and **concise explanations** of the general laws and the laws of the several States upon all matters which are subject to litigation, with numerous forms of legal documents.

MINING. Descriptions and illustrations of the mining of gold, silver, diamonds, coal, salt, copper, lead, zinc, tin and quicksilver.

WONDERS OF THE SEA. Herein are described and illustrated the many wonderful and beautiful things found at the bottom of the ocean, the plants, flowers, shells, fishes, etc., likewise pearl diving, coral fishing, etc., etc

STATISTICAL AND MISCELLANEOUS. Herein is given a vast amount of **useful** and **interesting information** on nearly every subject imaginable.

From the above brief summary of its contents some idea of what **a remarkably interesting, instructive and valuable work** the MAMMOTH CYCLOPEDIA is may be gained, yet **but a fractional part** of the **topics treated in this great work have been named. It is a vast storehouse of useful** and **entertaining knowledge**—unquestionably **one of the best** and **most valuable works ever published** in any land or language. **No home should be without it.** It is a work to be consulted every day with regard to the various perplexing questions that constantly arise in writing and in conversation, by the farmer and housewife in their daily duties and pursuits, and for continuous reading no work is more entertaining or instructive.

HOW YOU CAN OBTAIN IT FREE.

OFFER NO. 1. To any person sending $1.50 for a year's subscription to the AMERICAN AGRICULTURIST (new or renewal) we will present the Mammoth Cyclopedia, providing 15 cents additional is sent ($1.65 in all) to pay postage; delivered at our office free. The subscription and Cyclopedia sent to separate addresses if desired. Canvassers can solicit subscribers under this offer and select any of the premiums specified on the following pages for the number of subscribers secured.

OFFER NO. 2. For $2 we will send two yearly subscriptions and one copy of the Cyclopedia as a premium to the sender. Fifteen cents must be sent for the postage, or it will be delivered at our office free. At least one of these names must be that of a new subscriber. We make this offer for two subscribers in order to induce our friends to get at least one new name. Any present subscriber can with a little effort secure one new subscriber to send with his own renewal. Show the AMERICAN AGRICULTURIST to your friends and induce one or more of them to subscribe with you. Under this offer the sender is not entitled to any other premium.

OFFER NO. 3. For a Club of 5 at $1.65 each we will send **five yearly subscriptions** and **five sets** of the **Cyclopedia, post-paid,** and to the **sender** of the club will present a **copy** of the **Cyclopedia** and a **year's subscription free.**

TO EUROPEAN SUBSCRIBERS. We will send The Mammoth Cyclopedia to any country in the Postal Union, together with a year's subscription to the AMERICAN AGRICULTURIST, for 10s 3d.

TO CLUB-RAISERS. All subscribers taken under the above offers (except in offer No. 2) count toward a Club premium the same as when the AGRICULTURIST alone is taken, but the subscribers' premium counts nothing additional.

Remit by postal note, check, draft, money or express order or by registered letter. Make all money or express orders and checks payable to the AMERICAN AGRICULTURIST. Postage stamps taken for fractional parts of a dollar.

THE AMERICAN AGRICULTURIST, 751 Broadway, New York.

What Our Subscribers Say About the Mammoth Cyclopedia.

THOUSANDS PRAISE IT!

Extracts from a Few of the Letters Received.

JUST AS ADVERTISED. I am very well pleased with it. I find that you do not praise it any more than it deserves. I have found it is just as you advertised it. It is a work that every home should have.—[Mrs. Harold Wixon, Montvale, N. J.

I find it more than you say it is. The concise history of the war is worth all the price of the book. The biography is as good as the large Cyclopedia without being too long to read.—[William M. Allen, Pittsburg, Pa.

The Mammoth Cyclopedia received. I am pleased with them; they are full of useful information; each volume is worth more than the price paid for the four; they contain all that you advertise.—[Morgan H. Abbott, Millville, N. J.

INDISPENSABLE. Your premium books, "The Mammoth Cyclopedia," received. I am highly pleased with them. They quite come up to my expectations. I consider them an indispensable addition to the family library.—[Issac S. Vanderbilt, Nanuet, N. Y.

The Mammoth Cyclopedia recently sent me I can truly say is no humbug, but a work of real and permanent merit—will make a valuable addition to any village or private library, being what it purports to be, a compendium of useful knowledge.—[E. Stuart, Milan, Ohio.

I am surprised at the amount of information contained in them. Volume 2 contains more valuable information for the farmer and mechanic than I ever saw in works costing more than ten times the cost of the whole four volumes.—[James Daniels, Orrian, Iowa.

MORE THAN PLEASED. It certainly exceeds my expectations. It is precisely as you advertised the work. I am more than pleased with it. The illustrations are very satisfactory. The print is good, the contents valuable.—[W. Clouser, White Deer Mills, Pa.

Your Mammoth Cyclopedia is more valuable than I expected. Each volume is worth at least two dollars. I am more than satisfied with mine.—[S. A. Smiley, Batesville, Ark.

I am very much pleased with it. Think it fully as good as advertised; in fact, it is larger and better than I expected.—[E. A. Davis, North Fayston, Vt.

Your premium Mammoth Cyclopedia far exceeds my expectations. It is an elaborate work, worth many dollars to any one.—[C. S. Carpenter, Rockford, Ont.

A MARVEL OF CONDENSED INFORMATION. I am more than pleased with it. I am delighted. It is a marvel of condensed information, the more valuable because of its utility in every emergency connected with every-day work in the shop or on the farm, in the household, and, in fact, everywhere.—[Rev. M. Colegrove, Corry, Pa.

The Mammoth Cyclopedia is far more than I expected to see, and how you can afford to send it as a premium is more than I can see.—[John H. Neiss, Rosebud Agency, Dakota.

They are splendid, full of information; books that should be in every household; they are better than I expected.—[C. A. Blanchard, Friend, Nebraska.

The Mammoth Cyclopedia which you sent me is far above my expectations. It is, according to my idea, a great work, and is worth several times its price. The AMERICAN AGRICULTURIST never advertises humbugs.—[Wade Haines, New Carlisle, Ind.

BEYOND EXPECTATIONS. I am well pleased with the books entitled "The Mammoth Cyclopedia." I find them what you advertised them to be, and beyond what I expected. I find every day information in the Cyclopedia which is of value to my library.—[W. L. Moore, Pilot Point, Texas.

Am perfectly satisfied with it. It's a wonder to me that you can give so much for the small amount of money. You publish the best agricultural paper in America, the most practical, and that is what's wanted.—[Charles Sims, Saint Louis, Mo.

They are just the books for those who want to learn a great deal and have but little time to spare from their other duties. They are as advertised, and fully come up to my expectations.—[Jane Corwin, Greenport, N. Y.

A MINE OF WEALTH. They were greatly above my expectations. Cannot see how you can afford so great amount of information for so little money. A veritable mine of wealth.—[D. B. Moore, Dunkirk, Ind.

They are all I expected, and as far as I have examined them am much pleased with them, and it puzzles me to see how they could be gotten up so cheap, and in such good shape as they are.—[Jos. Sargeant, Ayer, Mass.

It is exactly what I wanted, and such as every one should have. It is of far more value to me than my thirty elaborate volumes of the American Cyclopedia, costing $180. The Mammoth deals in particular information on every subject that comes before the inquirer.—[William E. Thomas, Washington, D. C.

When I read your advertisement of the Mammoth Cyclopedia I rubbed my eyes in surprise. I sent for the work partly from curiosity. I didn't expect to receive ten dollars' worth for one dollar, but thought one-half the information advertised was cheap at the price. I am now more than ever convinced that we have reached an era when no one can say, "I am too poor to have knowledge."—[C. C. Lord, Hopkinton, N. H.

There is a great amount of valuable information in the Mammoth Cyclopedia. It would be well if every family in our country had a copy. It comes up to my expectations and to your representation. If the people knew what a valuable book it is, and how wonderfully cheap it is, you would sell at least three hundred thousand next year.—[Rev. Warner Long, Pittsburg, Pa.

The books will bear all you have said regarding them in your advertisement. It is most certainly your handsomest premium offer to date, and should bring you in a large number of new subscribers. I also have all the best farming periodicals published in the country. The AMERICAN AGRICULTURIST is at the top of the heap. Success to you and it.—[E. G. DeRochermon, Newington, N. H.

WORTH MANY TIMES ITS COST. The Mammoth Cyclopedia more than meets my expectations, and is a very valuable and interesting work, full of useful information, and worth many times its cost to any one.—[J. R. Powell, Chatham Center, N. Y.

CONTAINS VALUABLE INFORMATION. The "Mammoth Cyclopedia" is a most valuable addition to any person's library. The information it contains is invaluable, and I am happy to say that you have fulfilled in every respect the promises contained in your advertisements. Having been a subscriber to the AMERICAN AGRICULTURIST for the past three years, I have become so much attached to it that I welcome the coming of every number and consider myself many times repaid for the trifling cost of subscription. Wishing you continued success.—[Chas. M. Thomas, Stanstead Plain, P. Q.

ALL YOU ADVERTISE. The four big volumes you sent me of the Mammoth Cyclopedia fills my highest expectations, and is all you advertise it to be. You certainly have solved the problem of useful reading, the largest amount for the smallest outlay.—[F. G. McNutt, Shannon, Ill.

EXCEEDS EXPECTATIONS. The Mammoth Cyclopedia duly received. From reading your advertisement of this work I expected something fine, but it exceeds my expectations, both as to its nature and extent. It is clearly and concisely written, enabling any one to grasp its meaning without constant reference to Webster's Dictionary. Have already found it useful as a reference book. Should think the paper in the book cost more than the price you ask for it, and would advise every reader of the AMERICAN AGRICULTURIST to take advantage of your liberal offer.—[W. Douglass King, Chicago, Ill.

A LIBRARY IN ITSELF. I am very much pleased with the Mammoth Cyclopedia you sent me last week. It is quite a library in itself. Having occasion to refer to it to-day, I found it just the book I wanted. Your offer was generous in the extreme, and the Cyclopedia is most excellent.—[C. S. Loines, Oyster Bay, N. Y.

The Cyclopedia is quite up to and better than I expected; it is very useful for reference. I would not part with it on any account if I could not get another.—[Thomas McGuire, Orchard, Col.

Has far surpassed my most sanguine expectations. It is a set that everybody should have in their library.—[Jno. A. Plamondon, Powerscourt, Quebec.

The Cyclopedia is all I expected, and is in full, if not more, than your advertisement of it. A nice thing for the money. Contains a world of information for every one.—[Royal Sanderson, Townshend, Vt.

It is like the several premiums that I have gotten from you from year to year, always inclosing considerable valuable knowledge, and I am pleased to have them and return you many thanks.—[William A. McClure, Yeagerstown, Pa.

The Mammoth Cyclopedia is far better than I expected. There are in it several receipts worth many times the cost of the books.—[John E. Snider, Lena, Ill.

AMERICAN AGRICULTURIST

FRENCH ACHROMATIC TELESCOPE.

FULL SIZE OF TELESCOPE CLOSED.

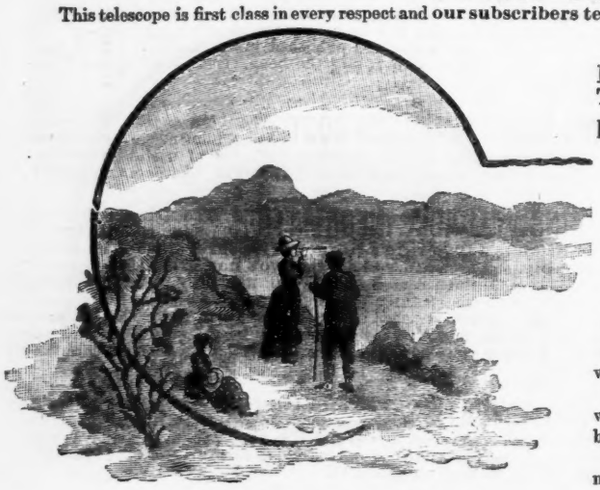
FOR ONLY $3.00 we will send one of these telescopes postpaid to any post office in the United States and in addition will include with each instrument

A YEAR'S SUBSCRIPTION FREE TO THE AMERICAN AGRICULTURIST.

The telescope and subscription sent to separate addresses if desired.

A FIRST CLASS INSTRUMENT.

This telescope is first class in every respect and our subscribers testify that it is equal to other instruments that cost from $5.00 to $15 each.



High power achromatic telescopes have heretofore sold at prices placing them almost beyond the reach of persons of moderate means. The telescope we now offer is just what the people want, **a real philosophical instrument, at a low price.**

FARMERS, HERDSMEN, HUNTERS, PROSPECTORS, SAILORS, TRAVELERS, TOURISTS, AND, IN FACT, EVERYBODY, WILL FIND THIS INSTRUMENT INVALUABLE.

Farmers and herdsmen can see their **cattle or sheep miles away.**

Hunters can distinguish **game at great distances,** and by this means not give warning of their approach.

The tourist can bring distant mountains, valleys and cities almost to his feet, while anyone with this telescope will soon become familiar with different objects that before (from their great distance) he knew nothing of.

Friends and acquaintances can be recognized at great distances, and the instrument will prove both instructive and amusing to everyone.

DESCRIPTION OF THE TELESCOPE.

DIMENSIONS:—The length of the telescope, when extended, is 16½ inches; when closed, 6 inches; diameter, 1¼ inches.

FIVE LENSES. This useful and beautiful instrument has **five lenses,** of the **best French manufacture. The object lenses are achromatic,** that is, **convex** and **concave,** having different retractive and dispersive powers, with the curvatures so adjusted that the chromatic aberration produced by the one is corrected by the other, and light emerges from the compound lens undecomposed, or free from color, **objects at a long distance** appearing clear and natural.

BRASS SLIDES. The slides and mountings are made of brass highly polished, the telescoping tubes fitting closely into each other.

BRASS SAFETY CAPS. **Safety caps** of **polished brass** cover the **exposed** ends of the instrument, **keeping out dampness** and **dust** when not in use.

MOROCCO COVERED TUBES. The main tube or body of the telescope is covered with handsome French morocco, making it altogether a most excellent instrument.

Each Telescope is furnished in a strong cloth covered case. It is strongly made and cannot get out of order, but will last for a lifetime.

HOW FAR YOU CAN SEE WITH IT.

If the atmosphere is clear you can see **the time on a tower clock at a distance of five miles. A man** who is **one mile away** will appear to be **fifteen rods from** you, and **persons** with whom you are familiar **can be recognized** at a distance of **three or four miles. The moons of Jupiter can be seen with it.** What are supposed to be **mountains** or **extinct craters** on the **surface of the moon** can be **seen plainly** with the glass.

There is not a man, woman or child that cannot find uses for such a glass almost every day of their life. **Many of our customers write us that they have never had so much pleasure and enjoyment** from a small investment as **this telescope has afforded them.**

(See Next Page.)

What Our Subscribers Say of This Telescope.

Equal to a $15 Instrument.

Some time ago I received my French Achromatic Telescope by mail in good order, and feel **well pleased** with it. I think it fills the recommendation of your advertisement. **I have compared it with a field glass costing $15** and with **another Telescope** of English manufacture of 3 inches more length **costing $7.00, and consider the power of yours fully equal to either of the higher priced glasses.**—[George H. Northrop, Naugatuck, Ct.

Worth Four Times its Cost.

The French Achromatic Telescope ordered of you some time since is indeed a **superb instrument.** I have frequently observed the **nail-heads in a barn wall at a distance of half a mile. Four times its cost would not induce me to part with it.**—[Marquis P. Truax, Almo, Ind.

Sees Objects 40 Miles.

The French Achromatic Telescope is **fully as represented in every particular** and exactly the same in all respects if not **better than the ten-dollar Telescopes** for sale in our **city stores.** I use it in my school and **my pupils see objects 40 miles off** quite distinctly as if right before us. **Can tell persons three miles off** and tell which direction the **vanes on barns** and **houses stand for 6 or 7 miles.**—[Erb Steiner, Spring Mount, Pa.

Wouldn't Take $5.00 for it.

Telescope received to-day. There are so many cheap imitations that I was reluctant about placing my order with you. But **I am well pleased with it** and it is **all you represent it to be. I would not take $5.00 for it.**—[M. W. Knight, Kingsdown, Kans.

Sees 30 Miles.

The French Achromatic Telescope I received of you gives **good satisfaction. Rocks, trees and bushes** are **distinctly seen** at the **top of Smoky Mountain** from our residence, **30 miles distant.**—[M. F. Johnson, Maryville, Tenn.

Sees Objects 12 Miles.

The telescope **answers my expectations fully. I can see objects 10 or 12 miles away very plain** when it is clear, and the Moon looks a great deal plainer through it than it does to the naked eye. I don't see how you can afford to give so much for the amount of money you receive. Other concerns offer telescopes which they claim are larger for less money, but it don't seem to me that they could be reliable; they must be cheaply and poorly made.—[Willis A. Warren, Abington, Ct.

Just as Represented.

The French Achromatic Telescope ordered, you sent me very promptly. **I find it to be as you represented in every detail.** It gives me much pleasure in looking off at long distance. **Objects one mile away** look to be almost **within reach. I would not part** with it for **a five dollar note.** Anyone wishing for a glass of this kind, will find it to be a prize. My experience is, when the AGRICULTURIST advertises anything it can be relied upon, as being as represented.—[W. H. Fifield, Chicopee, Mass.

Better Than an $11 Instrument.

The French Achromatic Telescope I ordered of you is received and is **just as good as represented. I compared it with one much larger that cost $11 and could see better with mine.** While it is a first class instrument it can be closed up and carried in your pocket without the least inconvenience.—[P. H. Sumner, M. D., Camptown, Pa.

Surprised at the Quality.

The Telescope ordered of you came to hand in due time and **I am quite surprised at the quality of it,** expecting nothing but a "cheap John" affair at the price paid, instead of which **I have an article of real merit and I think fully equal to three or five times its cost.**—[Geo. O. Guild, Bellows Falls, Vt.

Never Expected Such a Glass.

I have received the telescope in good order and **am well satisfied with it; it far exceeds my expectations.** I cannot tell how far I can see, as we live too much among the hills to give it full range, but **I never expected to receive such a glass for the price.** I got one advertised in another paper some years ago—it is much longer but no good; it is made of paper and looks like morocco and is a humbug. **I would not take three times for the one I got of you what I paid for it** if I could not get another like it. Anyone wanting a glass of this kind need not fear to invest in your offer.—[George A. Hoppen, Fishers Ferry, Pa.

Beautiful, Entertaining, Serviceable.

I received the Telescope O. K. and am well pleased. It speaks for itself, and when one of my comrades doubts its power, all I have to do to convince him is to hand him the glass. **It is a beautiful, entertaining** and above all **a serviceable instrument** that anyone would be proud to own.—[Chas T. Shaffer, David Island, New York.

All We Claimed for It.

I received the telescope by mail in good order. **Am more than pleased** with it and have **enjoyed myself** in using it while traveling through the country **more than double its cost.** I find it **better than I expected** and **all you claim for it.** I have let others try it and they **all pronounce it a very clear distinct glass, as good as they ever saw** for its size.—[Geo. B. Harris, Centreville, R. I.

Expectations Fully Realized.

It is **with pleasure** that I embrace this opportunity of testifying to **the merits** of the **French Achromatic Telescope** sent me by the "AMERICAN AGRICULTURIST." **I am much pleased with it** and I have **realized fully the expectations** which I derived from reading your advertisement respecting it.—[Geo. F. Beale, Cola, Pa.

Better Than Expected.

I received the Telescope all O. K. and find it to be **just what you advertised it to be and better than I expected to get.** I have compared it with one I paid $5 for and think it is **equally as good as the $5 Telescope.**—[Edgar Sweet, Kingston, R. I.

Just Splendid.

The telescope I received as a premium with your Magazine is **just splendid—superior to what I expected to get,** and is giving me and my friends **much pleasure,** for which accept thanks.—[L. A. Kennard, Boston, Mass.

Disappointed—Agreeably.

The French Achromatic Telescope came promptly to hand in answer to my order, and I have this to say in regard to it, viz: That in **two particulars I am disappointed. First, it surpasses my expectations.** Second, **I find it just as you advertised.**—[H. A. Smith, So. New Berlin, N. Y.

More than Satisfied.

When I first saw your advertisement of a Telescope for the small sum of $1.50 in connection with $1.50 for the AMERICAN AGRICULTURIST I felt half suspicious that the instrument could not be so powerful as represented. But I said to myself, "I never knew that firm to misrepresent any article they advertised and I will try one." I did so, and **after several weeks' trial am more than satisfied.** Last Sunday I went upon one of the neighboring hills to take a look at the flood, and with that Telescope **I could see what was going on miles away, read the names of steamers passing up the river, and the signs in the city, etc.** I am at a loss to know how so good an instrument can be offered for so little money.—[Alpheus Darrison, Anacostia, D. C.

HOW YOU CAN SECURE ONE.

On receipt of $3 we will send one of these Telescopes, put up in a neat case, by mail, post-paid, to any post-office in the United States, and in addition will include

A Year's Subscription Free to the American Agriculturist.

The subscription and instrument sent to separate addresses if desired.

How You Can Get This Telescope For $1.50.

Induce some friend or neighbor to hand you his subscription to the AMERICAN AGRICULTURIST $1.50), to which add $1.50, and we will send him a year's numbers and the telescope to you.

TO CANVASSERS: For $6 we will send six yearly subscriptions to the AMERICAN AGRICULTURIST and the Telescope to the sender of the club.

If you cannot procure six subscribers send four subscribers at $1 each and add $1 in money ($5 in all) and we will send the Telescope post-paid. Subscribers taking any of our book offers count the same as for the AMERICAN AGRICULTURIST only.

For $4 we will send the Telescope post-paid and the AMERICAN AGRICULTURIST for two years.

Address all orders to

The American Agriculturist, 751 Broadway, New York.

Contents of This Number.

Animal Ailments....102
Asparagus Beetles....88
Agriculture in the Common Schools....104
Barb-Wire Fence, The Law of....87
Bee Cellars, Temperature for....72
Beef Supply, The American....64
BOYS AND GIRLS:
Winning the Skates....2 *Illustrations*..81
Fritz and Fanny....82
The First Pigs in Scotland....82
Gyp....*Illustrated*..82
Ten Dollars for Somebody....83
Breed or Feed....70
Brood Sows, Care of....64
California Wheat Farms, The....3 *Illustrations*..68
Canadian Fruit-Growers....89
Carrot, The Half-Long, Stump-Rooted....*Illustrated*..73
Cellar and the Window, The....75
Chestnut, An Improved,—The Paragon....*Illustrated*..73
Chickens, "Artificial" versus "Natural"....71
Commercial Fertilizers, Will They Impoverish the Land 67
Corn-Marker, Home-Made....*Illustrated*..63
Corn, Measuring in the Crib....88
Cow, A, To Restrain from Kicking....*Illustrated*..63
Cows, Fresh, Provide for the....72
Crops of the Year....98
Egypt and Its Irrigation....*Frontispiece and Two Other Illustrations*..65
Farm Poultry, Feeding in Cold Weather....61
Farming in Foreign Lands....86
Fern Culture....4 *Illustrations*..75
Fowls, Blue Andalusian....*Illustrated*..61
From Far and Near....84
Fumigating Box, An Effective....*Illustrated*..74
Grafting....88
Grindstone, Rest for a....*Illustrated*..63
Horses, Shoeing....88
HOUSEHOLD:
Improvements for Cicely's Parlor....76
Making Rooms Comfortable in Winter....76
Hints About Winter Work....76
A Shepherd Dog's Joke....2 *Illustrations*..77
Furs and Furbelows....78
Manners at Meal-Time....78
For the Dining-Table....2 *Illustrations*..79
A Hanging Pin-Cushion....2 *Illustrations*..79
Value of the Flesh-Brush....79
Square for a Cushion-Cover or Quilt....*Illustrated*..79
A Pretty Crochet Pattern....*Illustrated*..79
The Trials of a Baby....80
The First Valentine....80
Japanese Dolls....80
For Freckles....80
Kitchen Lore....80
Incubator- and Brooder-Houses....2 *Illustrations*..62
Mistletoe, Growing the....89
New Publications....87
North Germany, Life in....*Illustrated*..85
Pigs, Feeding on Bananas and Guavas....72
Potato Contest, The New....91
Potato Competition, Lessons of the....4 *Illustrations*..58
Poultry, Cross-Bred, for the Market....64
Prize Crop Competition, The....92
Petroleum on the Farm....107
Roots in Winter....73
Salt, Value of for Milking-Cows....63
Science in Farming....94
Scrub Oaks, Clearing Land of....88
Seeds, Fine, How to Manage....74
Seeds, High-Priced....68
Seeds, the Nature and Preservation of....71
Sheep, Southdown in America....*Illustrated*..71
Sheep Sales in England....70
Spokane, The Montana Thoroughbred....*Illustrated*..67
Stables, Ventilation for....62
Sundry Humbugs....102
Tillage, Better Needed....90
Winter-Killing....64
Wheat Contest, The....92
Working for a Purpose....73
World's Record Broken, The....90

Aspinwall Potato Planter.—If the AMERICAN AGRICULTURIST grand cash prize in the new Potato Contest for 1890 goes to potatoes planted by the Aspinwall Potato Planter, the Aspinwall Mfg. Co., Three Rivers, Mich., will give $210, and one Aspinwall Potato Planter with Fertilizer and Corn Planter attachments all complete, listed at $90; making a total of $300.

Stanley in Africa !

AGENTS WANTED IN EVERY township to sell our new life of Stanley, entitled, "HEROES OF THE DARK CONTINENT." Splendid inducements. LIBERAL PREMIUM LIST FOR THE AGENT. 600 pp., 10 colored plates, 400 illustrations. Sells at sight. Write to HUNT & EATON, 150 Fifth Avenue, New York.

FEARLESS.

This Threshing-machine received the two last **Gold Medals** given by the New York State Agricultural Society; and has been selected, over all others, and illustrated and described in that great work, "Appleton's Cyclopedia of Applied Mechanics;" thus, establishing it as the **standard** machine of America. **Straw-preserving Rye-Threshers, Clover-hullers, Ensilage-cutters, Feed-mills, Fanning-mills, and Wood Saw-machines; all of the best** in market. The **Fearless Horse-powers** are the most **economical** and **best** Powers built for the running of Ensilage cutters, Cotton gins, and general farm and plantation use. For free Catalogues, address
MINARD HARDER, Cobleskill, N. Y.

100 SONGS Words & Music Complete. Choice collection of gems only 10c. GUIDE PUB. CO., ST. LOUIS, MO.

200 SCHOOL DIALOGUES, RECITATIONS and Readings, Humorous, Dramatic and Pathetic. A choice collection, especially adapted for School Exhibitions, Social Gatherings and Public Entertainments. Nicely bound. Sent post-paid for only 25 cts. W. Thomson, 69 Dearborn St., Chicago, Ill.

FREE SAMPLE CARDS for 1890. New Styles. Beautiful Designs. LOW PRICES and BIG OUTFIT FREE. SEND 2-CENT STAMP FOR POSTAGE.
U. S. CARD CO., CADIZ, OHIO.

CARDS FINEST SAMPLE BOOK of Gold Bevoled Edge, White Dove, Hidden Name Cards, ever offered, with AGENT'S OUTFIT for 2 CENTS.
National Card Co., SC10, OHIO.

$60 SALARY, $40 EXPENSES IN ADvance allowed each month. Steady employment at home or traveling. No soliciting. Duties, delivering and making collections. No Postal Cards. Address, with stamp, HAFER & CO., Piqua, O.

POEMS By Whittier, Longfellow and Tennyson, Illustrated. 3 volumes for only 10c.
F. W BENTON, Pub., St. Louis, Mo.

PLAYS Dialogues, Tableaux, Speakers, for School, Club & Parlor. Best out. Catalogue free. T. S. DENISON, Chicago, Ill.

BOYS Send us 6 cents in stamps and we will send you, by mail, an article you can have lots of fun with.
P. O. WEHOSKEY, Providence, R. I.

Will do it. Our Beard Elixir will force a **Mustache** in 20 days, full **Beard** in 30. Sample package, postpaid, 15c.; 2 for 25c.; one dozen, 75 cents. Agents wanted.
Howard Mfg. Co., Providence, R. I.

AGENTS WANTED. $1 an hour. 50 new articles. Catalogue and sample free.
C. E. MARSHALL, Lockport, N. Y.

DO NOT hesitate to send for illustrated circular, free, of BEST **Saw Filer** ever made. ROTH & BRO., New Oxford, Pa.

DETECTIVES

Wanted in every County. Shrewd men to act under instructions in our Secret Service. Experience not necessary. Particulars free.
Grannan Detective Bureau Co. 44 Arcade, Cincinnati, O.

HANDY BUTTONS.
Self-attaching. Everlasting. Full set for pants (suspender and front) mailed for 10 cts. Agents wanted. Casagreen Mfg Co., 79 W. Madison st., Chicago, Ill.

PATENTS THOMAS P. SIMPSON, Washington, D. C. No atty's fee until Patent obtained. Write for Inventor's Guide.

SCHOOL ADVERTISEMENTS.

University of the State of New York.

American Veterinary College.

139 and 141 West 54th St., NEW YORK CITY
15th Annual Session.

The regular course of Lectures commences in Oct. each year. Circular and information can be had on application to
DR. A. LIAUTARD, V. M., Dean of the Faculty.

SHORT-HAND Send for Catalog of Books and helps **SELF TAUGHT** for self-instruction
by BENN PITMAN and JEROME B. HOWARD, to
THE PHONOGRAPHIC INSTITUTE, CINCINNATI, OHIO.

HOME STUDY, Book-keeping, Business Forms, Penmanship, Arithmetic, Shorthand, etc., thoroughly taught by MAIL. Circulars free.
BRYANT & STRATTON'S COLLEGE,
445 Main St., Buffalo, N. Y.

SHORT HAND PAMPHLET AND 6 MAIL lessons, half-course. TEN CENTS. Lingle's College, 1330 Chestnut St., Phila.

THE GREAT AMERICAN TEA COMPANY

CHANCE FOR ALL
To Enjoy a Cup of Perfect Tea. A TRIAL ORDER of 3½ pounds of Fine Tea sent by mail on receipt of $2.00. Be particular and state what kind of Tea you want. Greatest inducement ever offered to get orders for our celebrated Teas, Coffees and Baking Powder. For full particulars address
THE GREAT AMERICAN TEA CO.,
P. O. Box 289. 31 and 33 Vesey St., New York.

POULTRY FARMS FOR SALE, of 5 acres each, for $150. Easy payments; in the great fruit and poultry center. Address
R. J. BYRNES, Hammonton, N. J.

BONE MEAL FOR POULTRY. Crushed Oyster Shells, Flint and Beef Scraps. Send for new price list.
YORK CHEMICAL WORKS, YORK, Pa.

MONITOR INCUBATOR,
Send for new circular.
A. F. WILLIAMS, Bristol, Ct.

IMPROVED EXCELSIOR INCUBATOR

Circulars free
Simple, Perfect and Self-Regulating. Hundreds in successful operation. Guaranteed to hatch larger percentage of fertile eggs at less cost than any other hatcher. Send 6c for Illus Cata. GEO. H. STAHL, Quincy, Ill.

FOWLS & EGGS.—Circular free. Red Caps, B. & W. Minorcas, W. & L. Wyandottes, W. & B. P. Rocks, Langshans, Handans and B. Turkeys. A. LEIDA, Delaware, O.

POULTRY PAPER ILLUSTRATED, 16 pages, 50c. per year, four months on trial for 10c. *Sample free.* C. C. DEPUY, Syracuse, N. Y.

PIGS, *Jersey* **Calves**; *Rough-Coated* **Collies**, *English* **Beagles**; *Standard* **Fowls, Turkeys, Ducks, Eggs. PRIZE STOCK** *cheap. 58th year.* F. MORRIS, Norway, Pa.

Standard Veterinary Ointment, stable and dairy; has no equal. Petrolatum Cream, medical and toilet, direct from the manufacturer. Free sample. Send for it.
M. LEWELLYN, Olean, N. Y.

AMERICAN AGRICULTURIST.

—o—

Terms of Subscription for the United States and British Provinces.

The AMERICAN AGRICULTURIST is published monthly and is mailed in time to reach subscribers on or before the date of issue.

Single Subscriptions $1.50 per year or 75 cents for six months. Clubs of five or more, $1.00 per year, or 50 cents for six months.

A FREE copy for every club of five for either term.

Subscriptions payable in advance.

Remit by postal note, express or post-office money order, registered letter, check or draft; postage stamps accepted for fractional parts of a dollar.

The date to which the subscription is paid is indicated by the number printed on the label attached to the wrapper enclosing each subscriber's paper. For instance, **517** indicates that the subscription expires with this February number, **518**, with the March number, and so on. The numbers of each issue will be found on the frontispiece.

Responsible subscribers will continue to receive this magazine until the publishers are notified to discontinue, when all arrearage must be paid.

New subscriptions can commence at any time during the year and with any number desired.

Canvassers wanted in every town to solicit subscriptions. Terms sent on application.

Rates to Foreign Countries.

The yearly subscription of the AMERICAN AGRICULTURIST in shillings and pence to subscribers in foreign countries is as follows:

	s.	d.	U. S. cur.
Africa except Egypt, Liberia and Congo	10	3	$2.46
China	11	3	2.70
Madagascar	12	3	2.94
St. Helena	10	3	2.46
Transvaal	11	3	2.70
New South Wales	7	3	1.74
Victoria	7	3	1.74
Queensland	7	3	1.74
New Zealand	7	3	1.74
Tasmania	7	3	1.74

Countries in the Universal Postal Union, including Newfoundland, Egypt, Liberia, Congo, and all others not mentioned above, 7s 9d; United States currency, $1.86.

In clubs of five or more a discount of 50 cents, or two shillings one penny, is allowed on each subscription.

Remit by post-office money order, payable to AMERICAN AGRICULTURIST, at New York General Post-Office, and inclose the money order with your letter to avoid delay and possible loss. Drafts on New York are acceptable in the absence of any other form of remittance.

Advertising Rates.

Ordinary Pages, **$1.00** per line (agate), each insertion. Last Page, and Third Cover Page, **$1.25** per line.
Second Cover Page, **$1.50** per line.
Page next to Reading and Last Cover Page, **$2.00** per line.
No advertisement taken for less than **$3.00** each insertion. Fourteen agate lines make one inch.

—o—

Direct all Business Communications pertaining to Subscriptions and Advertising to

AMERICAN AGRICULTURIST,
751 Broadway, New York.